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Bound

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Bound

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Submitted to the Faculty of
Worcester Polytechnic Institute
In partial fulfillment of the requirements for the
Degree in Bachelor of Arts
In
Interactive Media and Game Design
By

Leo Bunyea

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Abstract

Bound is an art, cognitive empathy game developed for PC in Unity during the 2018-2019 academic year at Worcester Polytechnic Institute. *Bound* is an autobiographical artifact that exists to create an impactful experience for its players and encourage them to consider the physical limitations that wearing a binder may impose on the transmasculine community. It does this by recreating the mental and physical stress associated with running in a chest binder through its exploration and rhythm game mechanics.

Bound's narrative features an adult transgender man who returns home to go running on his middle school's public track. He has ignored the health and safety warnings on the packaging of his binder and decided to go on that run with it on. Eventually, he has trouble breathing and passes out on the track. This event is situated as a memory that the protagonist is recounting to a healthcare professional.

Bound is not designed for anyone with a transmasculine identity. As a queer designer, I grappled with the issue of appropriating the experiences of this underprivileged group for the potential fetishization of others. This paper unpacks my feelings of apprehension towards queer and empathy games. It also discusses the final version of *Bound*, the process of its design and creation, and player feedback. According to my formative evaluation, *Bound* was able to effectively communicate an intense and emotional transgender narrative to its players.

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Introduction

The existence of transgender people in the United States has always been political. Their right to affordable healthcare, their access to public restrooms, and their protection from gender-based discrimination has been a recurring topic of debate. Just recently, in January of 2019, president Donald Trump issued a ban on transgender service members, revoking their ability to fight and serve [10]. In addition to this, twenty-eight transgender individuals were murdered in hate crime-related incidents in the year of 2018. Almost all of them were transgender women of color. The continuation of blatantly discriminatory legislation and violence against this community is a testament to the social stigma associated with them [19].

My experience as a transgender man colors how I interact with the world. My body of work as a game designer is autobiographical, highlighting the plight of this community that I belong to. I have aspired to create games that share small facets of the transgender experience in the spirit of inciting empathy in their players. I am not the first to attempt to translate transness into games. Anna Anthropy is a game designer and also a transgender woman whose works deals with anything from queer love with *Queers in Love at the End of the World* to medical transition with *dys4ia* [3, 4]. Similarly, Mattie Brice is a transgender woman of color who makes games about the intersection of her gender identity and racial background, as exemplified in *Mainichi* [8, 9]. There are even titles produced by larger game companies such as *Dream Daddy*, *Horizon: Zero Dawn* and *Dragon Age: Inquisition* which include representation of transgender identities [15, 16, 7].

In most cases, only games created by solo, queer developers are centered around a hyper specific transgender experience. All the previously mentioned solo, queer developers

identify as transgender women. I reference these designers because they are arguably well-known names among the queer game studies community [13]. Because of their identity, their work doesn't speak to the experiences of transgender men, which I'll explore in the background section of this paper. Realizing this void in content and wanting to share a personal story, I made a game which explored a common experience among transmasculine people, binding, with *Bound*, the subject of this paper.

Bound is an art game developed for PC that features a combination of exploration and rhythm game mechanics. The game is focused on the mental and physical stress induced by running in a chest binder. *Bound* was developed on Worcester Polytechnic's campus in Unity 2018 over a fourteen-week period. *Bound*'s player character is an adult, transgender man who yearned to rekindle the love for running he fostered pre-transition. One afternoon, he returned to his former middle school and started to jog around its public track. However, the chest binder that he was wearing inhibited his ability to breathe and he eventually passed out. This event has landed the player character in the hospital, where he must recount what transpired to a healthcare professional.

Many aspects of this game were deeply personal which heavily influenced my development process. I have an athletic history that was constantly in conflict with my gender identity. For me, it was necessary to wear a chest binder in order to feel comfortable and confident in public. Without one, the dysphoria that I experienced was debilitating. Binders, by design, are tight in order to flatten or masculinize a chest. To attempt any kind of physical activity while wearing one was both difficult and frustrating. An entire sphere of my life was erased due to my complex and often hateful relationship with my body. This was where the

concept for *Bound* arose. Just recently, I was fortunate enough to have had gender affirming top surgery. Suddenly, I was able to go to the gym in a t-shirt, run on the treadmill without wheezing, and bounce confidently from machine to machine. While developing *Bound*, I revisited the anger and frustration that I felt during that time in my life and chose to share it.

This paper mainly details my iterative design process which was informed by gameplay analytics and tester feedback. However, it also discusses my failures, my successes and my growth over the duration of this project. My journey as a transnarrative designer has left me with more questions than answers about how to respectfully design around marginalized experiences. Because *Bound* is not intended for the transgender community, it runs the risk of appropriating their experiences for the benefit of the privileged. Regardless of my own apprehension about empathy in games, according to my formative evaluation process, *Bound* was able to effectively communicate an intense and emotional transgender narrative to its players.

Background

The discussion of this project requires base level knowledge of gender identity and its relationship to the transgender community. This includes the concept of gender dysphoria and different practices used by transmasculine individuals to mitigate it. This chapter will also explore empathy games and detail queer activism and storytelling within them.

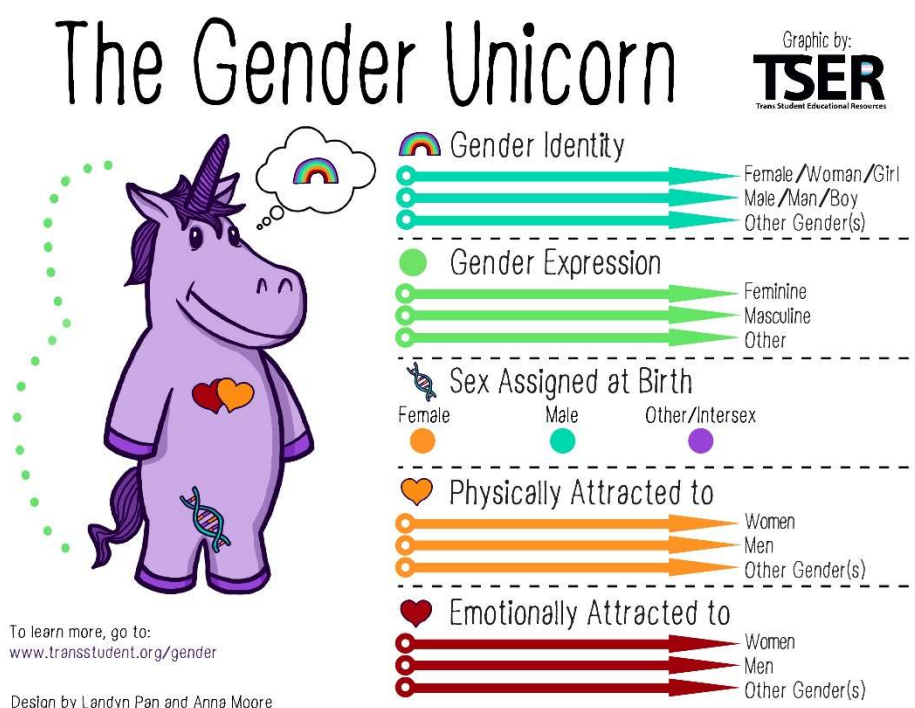


Figure 1: Gender Unicorn infographic (2019) [27]

The Term Transgender

“Transgender” is an umbrella term that encompasses many different gender identities and is used to refer to individuals who do not identify with the sex that they were assigned at birth [2]. Traditionally, it has been used to refer exclusively to the binary transgender population which consists of transgender men (men who were assigned female at birth) and transgender women (women who were assigned male at birth). However, gender exists on a spectrum that challenges the traditional dichotomy of “man” and “woman.” The well-known

“Gender Unicorn” infographic (Figure 1) from the educational organization TSER is a useful visualization of this concept. It illustrates that an individual can identify with any degree of “male-ness” independent of their identification with “female-ness.” Gender can also be experienced outside the boundaries of man and woman, this is called “nonbinary.” Some people who use this label do not feel as though they are a man or a woman, rather somewhere in between. Nonbinary can also refer to a distinct lack of gender as is the case with the agender community. The focus of this paper and project is on transgender men and transmasculine (nonbinary inclusive terminology for someone assigned female at birth, but identifies with “male-ness” more than “female-ness”) people [28]. This is the population within the transgender community most likely to participate in the practice of chest binding.

Gender Dysphoria

An inclusive way to describe gender dysphoria is: the emotional discomfort that is caused from someone’s physicality not in congruence with their identity. Gender dysphoria has a history of being defined in binary terms. For example, gender dysphoria is classified in the *Diagnostic and Statistical Manual of Mental Disorders* as an experience of at least two of the following: “a marked incongruence between one’s experienced/expressed gender and primary and/or secondary sex characteristic, a strong desire to be rid of one’s primary and/or secondary sex characteristics, a strong desire for the primary and/or secondary sex characteristics of the other gender, a strong desire to be of the other gender, a strong desire to be treated as the

other gender, a strong conviction that one has the typical feelings and reactions of the other gender¹.”

Gender dysphoria can be experienced in different levels of severity and can be localized to specific regions of the body. Transgender people sometimes discuss experiencing “bottom dysphoria” while showering or in intimate situations. This means that the individual is disturbed by the physicality of their sex organs because they do not consider them to be a reflection of their gender identity. This may cause transgender people to avoid having sex or being naked for extended periods of time. There are many methods of alleviating gender dysphoria, some involve silicone prosthetics, while others involve medical and surgical intervention [2].

The Practice of Chest Binding



Figure 2: Promotional image for GC2B's All Nude Collection (2019) [17]

¹ Before discussing this any further, let's first acknowledge how exclusive the language used here is [2]. The phrase “other gender,” unfortunately, reinforces the fallacy that gender exists within a binary system [27]. It's even more unfortunate that this definition is what can potentially gatekeep nonbinary individuals from access to medical transition. It's important to recognize the existence and validity of gender dysphoria in nonbinary individuals in the context of this project, which is the reasoning for exposing its history.

Chest binding is one of the aforementioned methods to alleviate gender dysphoria among transmasculine people. In this practice, some article of clothing or cloth material is wrapped tightly around an individual's chest to flatten it and make it appear more masculine. Engaging in chest binding is understood to have "substantial mental health and safety benefits" for those affected by chest dysphoria [11].

Binding should only be done with a chest binder from reputable companies that do not use Velcro or metal fasteners (Figure 2). Those who use bind with things like duct tape or Ace bandages may face serious health risks such as torn muscles, bruised ribs, and spine alignment problems. Most companies do not recommend that anyone wear a binder for longer than eight hours at a time to avoid serious injury. However, a study in Transgender Health revealed that 88.9% of participants had experienced at least one negative binding related health symptom [11]. This could indicate either that the warnings issued by binder manufacturers are not being heeded or transmasculine individuals are not binding with the proper materials. Whatever the reason, transmasculine people are participating in a tradition which is negatively impacting their health just to cope with the emotional stress induced by gender dysphoria.

Empathy Games

Games as media are constantly referred to as "active" when compared to older forms of media like movies and books. It is argued that allowing players to take a more involved role in the narrative enhances their "immersion" in the experience [29]. This argument can be expanded upon considering Lankoski's conclusions about goals, affectivity, and empathy in games. He concludes that,

All games exploit emotions that relates to goals status evaluation and reasoning future options. Games with characters can infect affects using characters affective expressions and affective simulation where the inferred goals have important role. By analyzing the goal and event structure of a game (including all kinds of affective expressions), it is possible to see how the game aims to manipulate player's affects and how it creates affective impact. [21]

According to this conclusion, it is the goal-based nature of games that contributes to their ability to engage players in a unique way. This unique engagement makes games an interesting medium to attempt to foster empathy, especially when players are allowed to assume characters who possess identities that are unfamiliar to them.

Social science discusses empathy under two lenses; a cognitive lens and an emotional lens. Cognitive empathy describes the mental ability to imagine another individual's point of view. Emotional empathy is the emotional sensitivity that an individual has to the experiences of other people. Empathy games are video games designed to make players experience both cognitive and emotional empathy [6]. The subject of this project, *Bound*, can be categorized as a cognitive empathy game because it encourages its players to consider the hardships faced by the transmasculine community.

Queer Games

With more development resources becoming financially and skill-level accessible, the independent development scene saw the emergence of "queer games" in 2012. These are games that feature the marginalized voices of the LGBTQ+ community developed in accessible

environments such as Twine. The movement gained its momentum because of the transgender, women designers who founded it [13].

Anna Anthropy, author of *Rise of the Videogame Zinesters: How Freaks, Normals, Amateurs, Artists, Dreamers, Dropouts, Queers, Housewives, and People Like You Are Taking Back an Art Form* and game designer, is one of the central figures of the “queer games” initiative. One of her most influential works is *dys4ia* [13]. It’s a game that was originally uploaded to the flash game website Newgrounds, which was infamous for its outrageously violent and cartoony content. *Dys4ia* is a memoir game that details the beginning of Anthropy’s medical transition process, particularly her fight for hormone replacement therapy. It features minigames that are divided into chapters that each highlight one aspect of being a transgender woman [3, 22].

Meritt Kopas (merritt k) is another transgender woman and game designer who has made a series of autobiographical games, including *Lim* and *Conversations With My Mother*. *Lim* is created with abstract colored squares to depict the damaging effects of a normative society of a transperson. *Conversations With My Mother* is a game that allows the player to assume the role of Merritt’s mother when responding to her child in an email. However, none of these games are currently available for play which suggests that Merritt has shifted away from making games. Merritt has since expressed discontent with the genre of memoir for conveying transnarratives,

There are a lot of parallels between trans people’s literature and trans games: in both cases trans authors are both rejecting traditional literary forms and appropriating them, using them to tell new kinds of stories. Importantly, both trans literature and trans

games represent a breaking out of the genre of memoir, to which trans people have been mostly confined by traditional publishing. This is a big deal because memoir is fundamentally outsider-oriented: it's about explaining how weird and gross and sexy it is to be a trans person to a cisgender audience. But more and more trans authors are forming our own publishers, or using the internet to get around gatekeepers entirely and release interactive works directly to our communities. [13]

This is an important perspective to consider when discussing and critically analyzing memoir-style games about transgender experiences, such as *Bound*.

The last transgender woman designer mentioned in this paper to contribute to this movement is Mattie Brice. She developed *Mainichi* in RPG Maker VX [8]. The player assumes the role of Mattie, a transwoman of color, in the game and dictates the level of effort that Mattie puts into her appearance. Regardless of what the player chooses, Mattie is still harassed on the street on her way to meet her friend for coffee. The conversation that Mattie has with her friend reveals that she's depressed and deprived of emotional connection. The game repeats itself, emphasizing the monotony of the life of a transgender woman of color [25, 9].

All three of these artists were critical in pioneering the queer games movement and telling the stories of transgender people [13]. As discussed in the Introduction, all of these designers self-identify as transgender women. Seeing as how their games in this movement are autobiographical, so they do not capture the experiences of transgender men. While *Bound* conveniently fills this void in ludic content, it remains an expression of personal past trauma.

Final Game & Experience Design

Experience Goal

Bound's experience goal is to elicit the physical and mental stress that is associated with running in a chest binder. *Bound* is not an experience that is supposed to be fun or enjoyable, rather it is supposed to be impactful and inspire introspection.

Target Audience

Bound is designed for current and future allies of the transgender community who want to put effort into empathizing with their day to day struggles. It is assumed that players are familiar with the concept of transgender identities, both binary and nonbinary, and know what a chest binder is.

Bound was not designed for any member of the transgender community, especially those that identify as transmasculine. People who have lived this experience do not need to relive it in order to understand it. *Bound* is also not designed for the mainstream “gaming” audience that values mechanical skill above a narrative experience. *Bound* is not a game that can be “won” or fulfills a power fantasy that many AAA titles do [12]. *Bound's* intention is to, instead, raise awareness about activities that aren't accessible to those who wear a chest binder to alleviate their dysphoria. While the focus of the game on one specific activity, it aims to inspire the player to consider other limitations that a chest binder may place on the wearer. It also attempts to share that stressful experience through gameplay.

User Stories

User stories in the context of this paper are short narratives of fictional people interacting with *Bound*. Three separate identities from various racial backgrounds, classes,

genders with different motivations to play the game are represented below. Their stories are indicative of the ideal outcome of their play session.

User Story 1 – Cisgender Woman, Age 20, White, Upper Class, College Student – Sarah Parker

Sarah's best friend on campus, Toby, is a transgender man. Toby has confided in her several times about how uncomfortable and limiting his binder is. Sarah is concerned for the health and safety of Toby but doesn't understand what compels him to wear the garment in spite of how it physically makes him feel. Toby has recommended that Sarah play *Bound*, a free game on itch.io about running in chest binders. Sarah, wanting to support her friend agrees even though she does not consider herself to be much of a "gamer." She downloads the game and begins to play it. After a complete play session, Sarah has begun to understand what Toby might be feeling when he engages in different physical activities while wearing his binder.

User Story 2 – Cisgender Man, Age 46, Latinx, Middle Class, Parent – Joao Sousa

Joao is the father of a transgender man, Luis. Joao is mostly supportive of his son's gender identity. Luis has started talking to his father about starting to medically transition. He's expressed that finding a surgeon for gender affirming top surgery is one of the first items on his list. Joao is scared of allowing his son to alter his body in such a permanent manner. He does not understand how dysphoria is negatively affecting his son. Joao looks online for resources about chest dysphoria in transgender men and stumbles across *Bound* on itch.io. He downloads the game and plays through it. When he's completed the experience, he understands how uncomfortable wearing a binder must be for his son and can think more clearly about what the benefits of top surgery may be for Luis.

User Story 3 – Cisgender Woman, Age 32, Black, Middle Class, LGBTQ+ Advocate – Ciara Mensah

Ciara frequently attends the local rallies organized by her community's queer advocacy group. She identifies herself as an LGBTQ+ activist. She regularly donates to organizations like

GLAAD and the Trevor Project and has marched several times in major cities for queer rights. At this particular rally, there are different groups tabling at a popular venue in town. One of the tables has laptops open with *Bound* running. Ciara sits down in front of one of the laptops and begins to play the game. After finishing it, she now has a better understanding of the physical limitations that binding may put on a transmasculine person. Even though she does not personally have any friends who identify as transgender, she is happy to further educate herself on the issues that they may be faced with.

Gameplay Flow

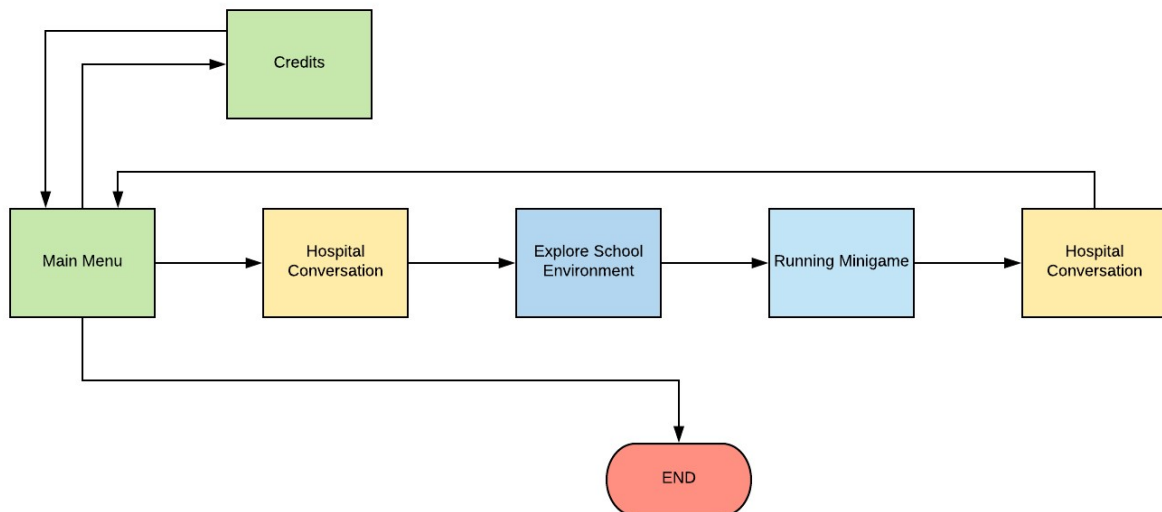


Figure 3: Gameplay flow diagram

Bound's gameplay follows a linear structure (Figure 3). From the main menu, the players can press the “Start” button to begin the game, the “Quit” button to exit the application, and the “Credits” button to view the credits screen (Figure 4).

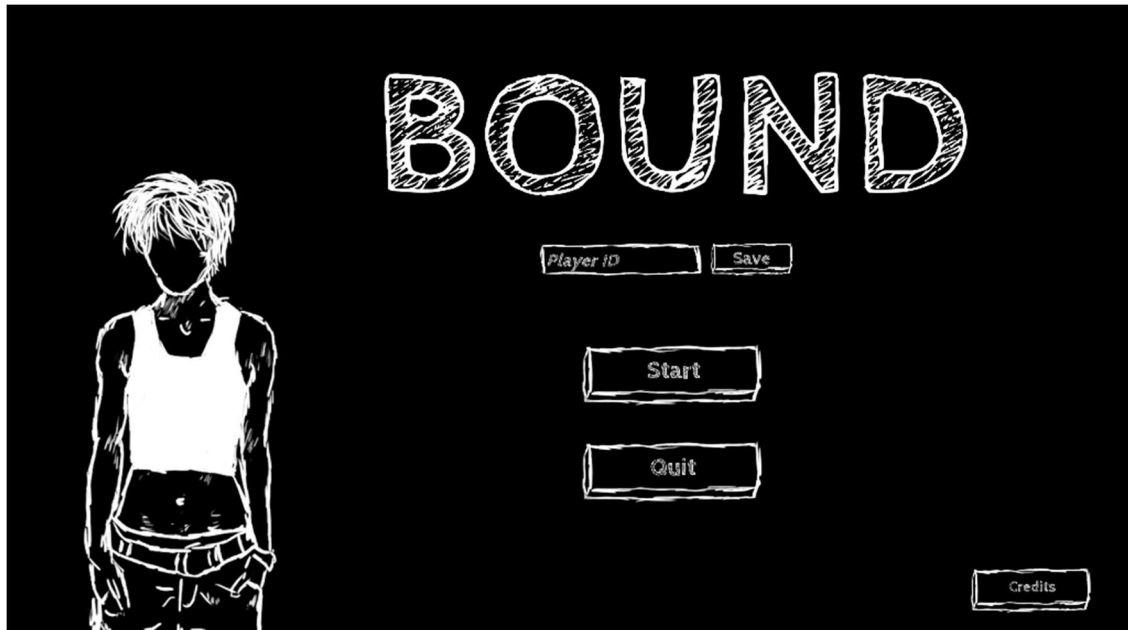


Figure 4: Screenshot of Bound's main menu

Starting the game will initiate the introduction sequence which consists of a black screen and a conversation between the player character and a medical professional. Once this sequence is finished, the player is dropped into the game's environment; the exterior of a middle school. Here, players can explore their surroundings (Figure 5).



Figure 5: Screenshot of Bound's environment

Once players navigate the player character to the top of the track, the minigame portion of the experience is initiated. Control of the player character is revoked from the player as the player character begins to sprint around the track. “W,” “A,” “S,” and “D” prompts slide up the screen. When the prompts match with that key’s receiver the player must strike the corresponding key (Figure 6).

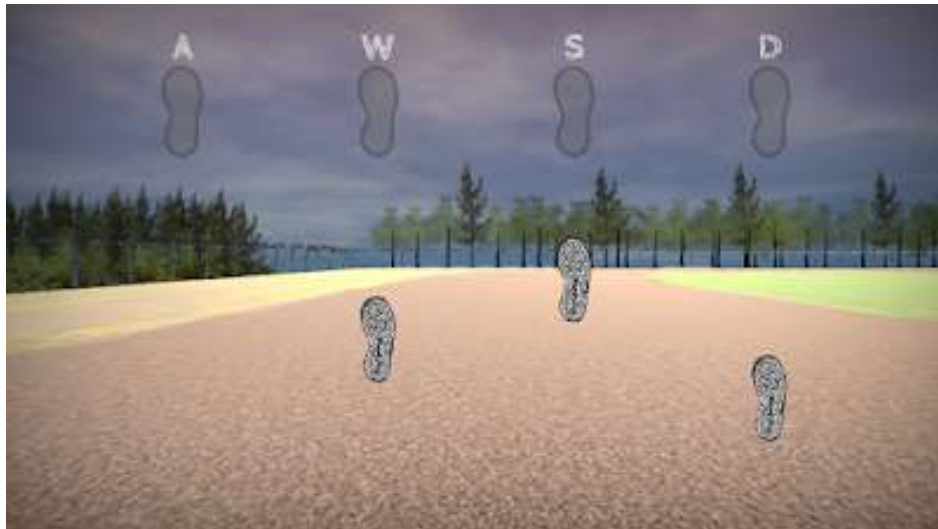


Figure 6: Screenshot of Bound's minigame

As time passes, these prompts spawn and travel towards the receivers faster. If a prompt is missed exiting off the top of the screen, or a player strikes a key when there is no prompt in the receiver, they are twenty percent closer to the end of the minigame (Figure 7).

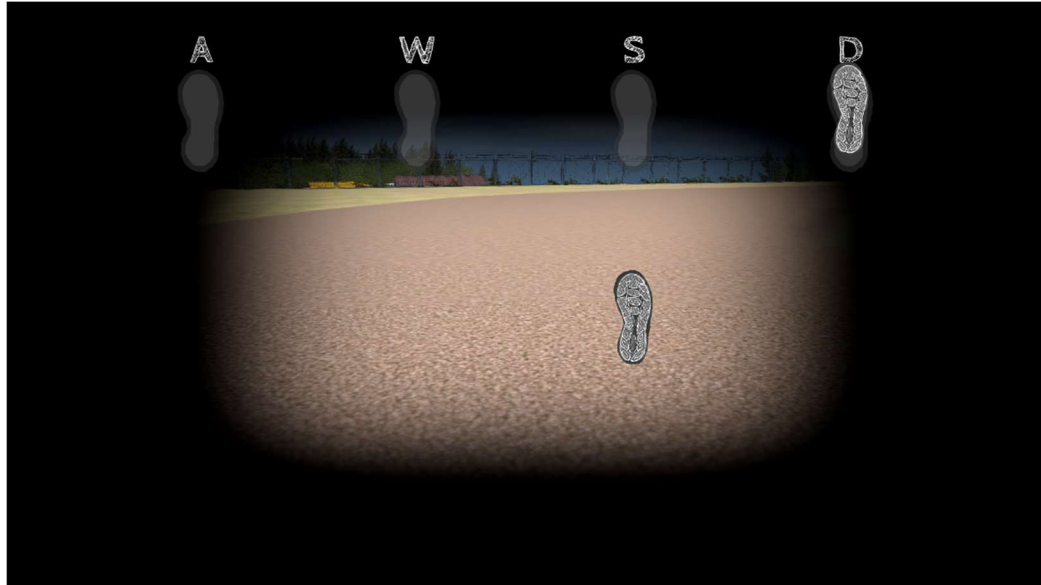


Figure 7: Screenshot of minigame failure effect

When the player inevitably fails the minigame, they are taken back to the same black screen and hospital environment that the game started in. The ending of the conversation between the player character and the medical professional is played. After this, the player is returned to the main menu.

Narrative Design

The story is told from the perspective of a transgender man and is linear with no opportunity for player agency. The narrative is brief, spanning over the course of only a few minutes. The purpose of the dialogue is to establish that; the main character is wearing a binder, the main character self identifies as transgender, the main character loves to run, and they have been transported to a hospital because of an event that involves those three things. The start and end of the story take place in that hospital, while the middle is situated as the player character's memory of that event.

Script

1. DOC: Are you in any pain?
2. PC: No.

3. *DOC: Can you tell me what happened?*
 4. *PC: I went on a run.*
-

1. *PC: Every day after lunch, I used to fly down this sidewalk and up those stairs to the track.*
 2. *PC: My friends were never able to catch up with me so they would just lean back on the chain link fence and watch. Flashing me a thumbs up when I blew by.*
 3. *PC: I want that again.*
 4. *PC: "Do not, under any circumstances, wear for more than eight hours a day."*
 5. *PC: "Do not wear during strenuous physical activity."*
 6. *PC: That's what the package told me.*
 7. *PC: Then, later, when I googled it, the internet told me the same thing.*
 8. *PC: So, I said, "Fuck it" and now I'm here where I went to middle school like... eight years ago.*
 9. *PC: Wearing this binder that I'm not supposed to and running shoes that I haven't touched since I came out.*
-

10. *PC: I'm ready to be that kid with windswept hair and basketball shorts again.*

1. *PC: But I was wearing a binder and it was hard to breathe. So, I just... Passed out.*
2. *DOC: Why didn't you stop?*
3. *PC: I don't know. I think I'm just tired of feeling helpless.*
4. *DOC: Helpless? I'm afraid that I don't understand.*

The script is separated by horizontal lines where the shifts in environment and gameplay occur. Lines designated with "PC" are lines read by the player character. Lines designated with "DOC" are lines read by the medical professional. The first and last chunk of lines are read in the hospital while the middle chunk is narrated over the player's exploration of their environment. The tenth line plays during the transition from players exploring the environment to the running minigame.

Minigame Design

Bound's minigame is initiated as soon as the player character begins to jog around the track. It is designed to task the player with an activity that is both physically and mentally

strenuous to mimic the turmoil of the player character. The minigame is destined to end in failure. The player character is fated to pass out due the necessity of their binder.

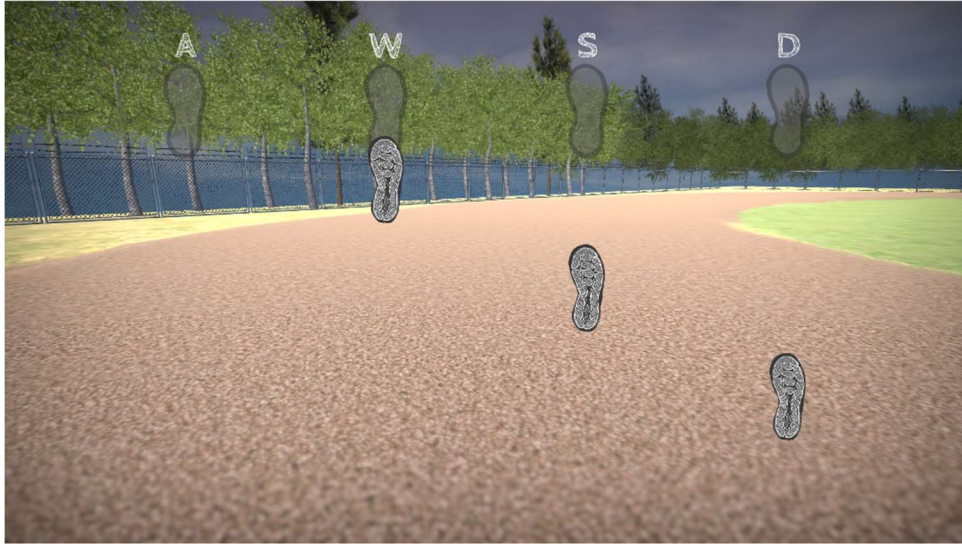


Figure 8: Second screenshot of minigame

Figure 8 depicts the minigame in its final form. It's a simplistic implementation of a rhythm game. However, the prompts are not being hit in time with music, but instead to with the pace of the player character. Most other rhythm games that follow this convention will have sustained prompts where that key must be held down for a length of time or multiple prompts that must be struck at the same time. Usually these signify sustained notes or chords in a song. This implementation is simplistic in that it doesn't include these features because they don't make much logical sense in the current context. Instead, difficulty is increased through a "time stage" system.

Each time stage lasts for a certain number of seconds. In the final version of the game, the time stage lasts for eight seconds. When eight seconds pass, the spawn time between prompts is decreased and the prompt's travel speed is increased. The player is intended to fail the minigame, so the game will continue to increase in difficulty in a linear fashion. This

eventual relentless barrage of prompts is designed to make the player feel stress and panic to parallel the experience of the player character. After a player makes five mistakes, the running minigame is over. A mistake can be defined as either a key press when there is no prompt on the associated receiver or allowing a prompt to pass by the receiver and up off the top of the screen.



Figure 9: Comparison between COD WWII visual damage effect (right) and Bound's minigame (left) (2019) [1]

An important aspect of the current minigame is the audiovisual feedback that it provides to the player. When players do make a mistake, a sharp inhale sound effect is played and a slow, black vignette will creep its way onto the screen as the player character starts to slow down. A similar effect is used in first person shooter games to communicate that you have taken damage. For example, in Call of Duty WWII, after the player is shot, there is a red vignette effect that consumes the edges of the screen (comparison in Figure 9) [1]. It immediately communicates that something bad has happen. In addition to this, the receiver that the player pressed is tinted red suggesting that was the source of the mistake. If a player correctly clears a prompt, then the receiver is tinted blue, a cool and nonthreatening color.

UI Design

Because the core of *Bound*'s gameplay experience is situated as a memory, this is reflected in the user interface. When players first run the application, they are greeted with the main menu. The players first impression should be one that inspires introspection.

Main Menu

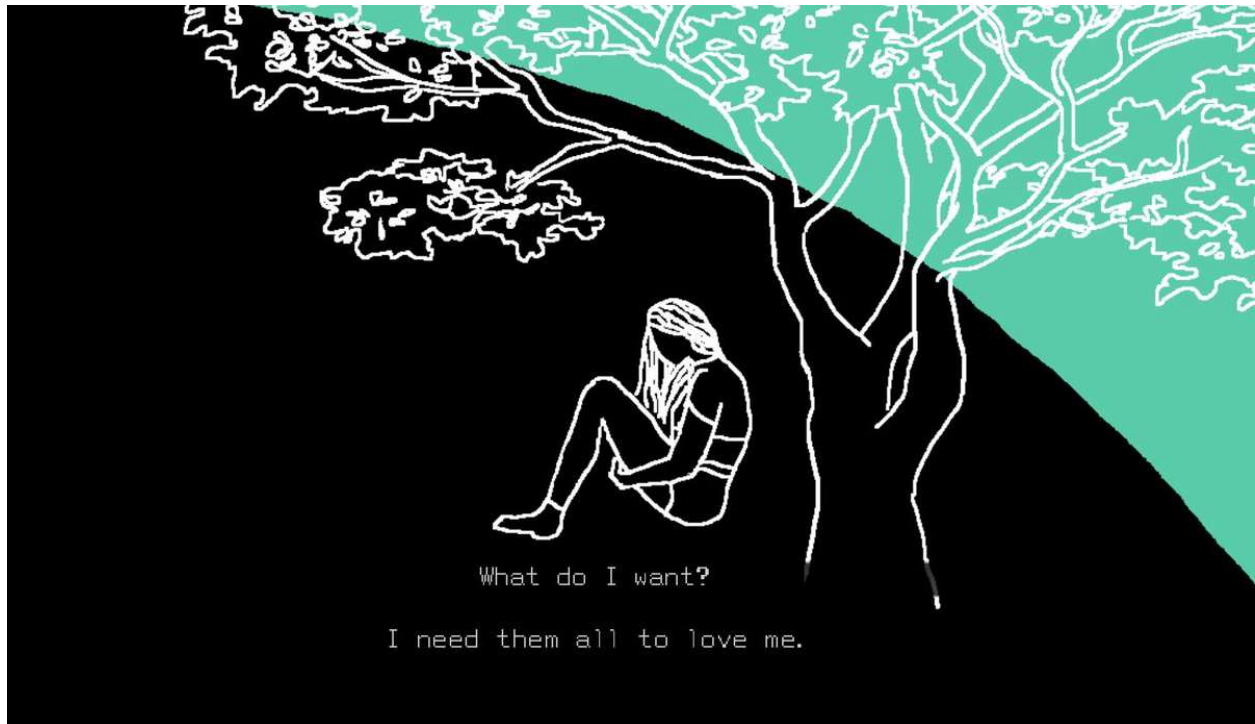


Figure 10: Promotional image for *The Earth is a Better Person Than Me* (2018) [26]

The color scheme of the main menu is black, white, and grey. The background is pitch black while the graphics and text are white. The font and graphics are done in a “sketchy” art style to give the illusion that the protagonist had sketched the user interface elements in their journal. To reinforce this feeling, a scribble sound effect plays when buttons are highlighted and a page turning sound effect plays when a button is pressed. This visual style is inspired by Kara Stone’s visual novel, *The Earth is a Better Person Than Me* which pair well with the game’s raw, emotional content (Figure 10) [26].

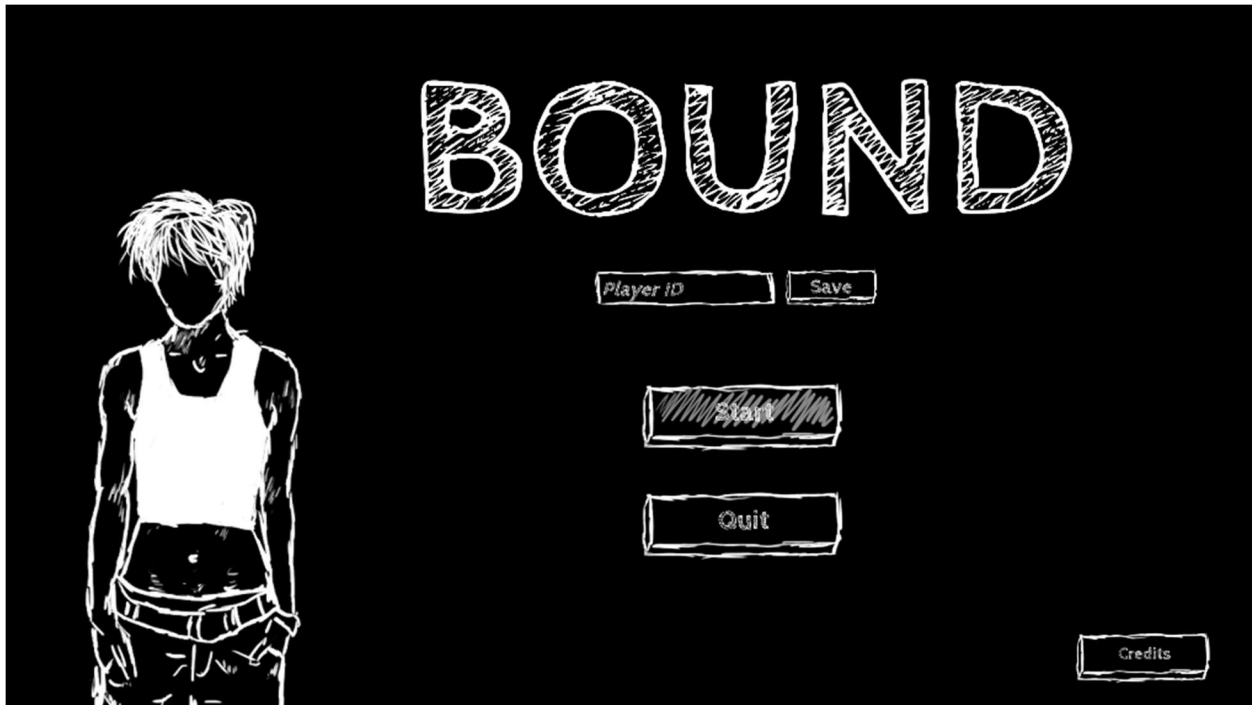


Figure 11: Screenshot of Bound's main menu with a button selected

The main menu is also the only place where the player can see some sort of physical representation of the player character. Even in this depiction, their face is devoid of features. The focal point is the solid white chest binder that they are wearing, priming players to think about this practice (Figure 11).

Minigame

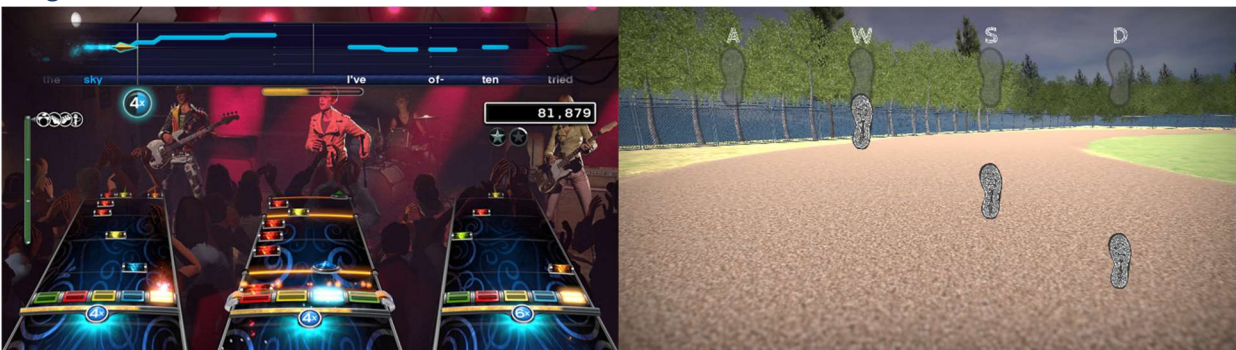


Figure 12: Comparison between Rock Band 4 promotional image (left) and Bound's minigame (right) (2016) [23]

The user interface elements of the minigame follow the same “sketchy” style as the main menu while being as minimalistic as possible. It follows the same structural conventions of

most other rhythm games; there is a row of note receivers that are attached to lanes that notes travel down. In *Bound*, the receivers are situated across the top of the screen and the “notes,” which I have referred to as “prompts,” fly upwards towards the receivers. The prompts traveling upwards instead of downwards or sideways implies forward motion and reinforces the direction that the player character is moving.



Figure 13: Comparison between *Dance Dance Revolution* (left) and *Bound's* minigame (right) (2018) [24]

The prompts take the shape of grey running shoe foot prints which is a departure from the convention of most other rhythm games. Traditionally “notes” in rhythm games are associated with different colors per track. The prompts themselves usually take the form of arrows in the case of *Dance Dance Revolution* (Figure 13), or three-dimensional nodes in the case of *Guitar Hero* or *Rock Band* (Figure 12). Using a footprint suggests that each successful button press relates to the player character’s footfalls.

Game and Experience Design Process

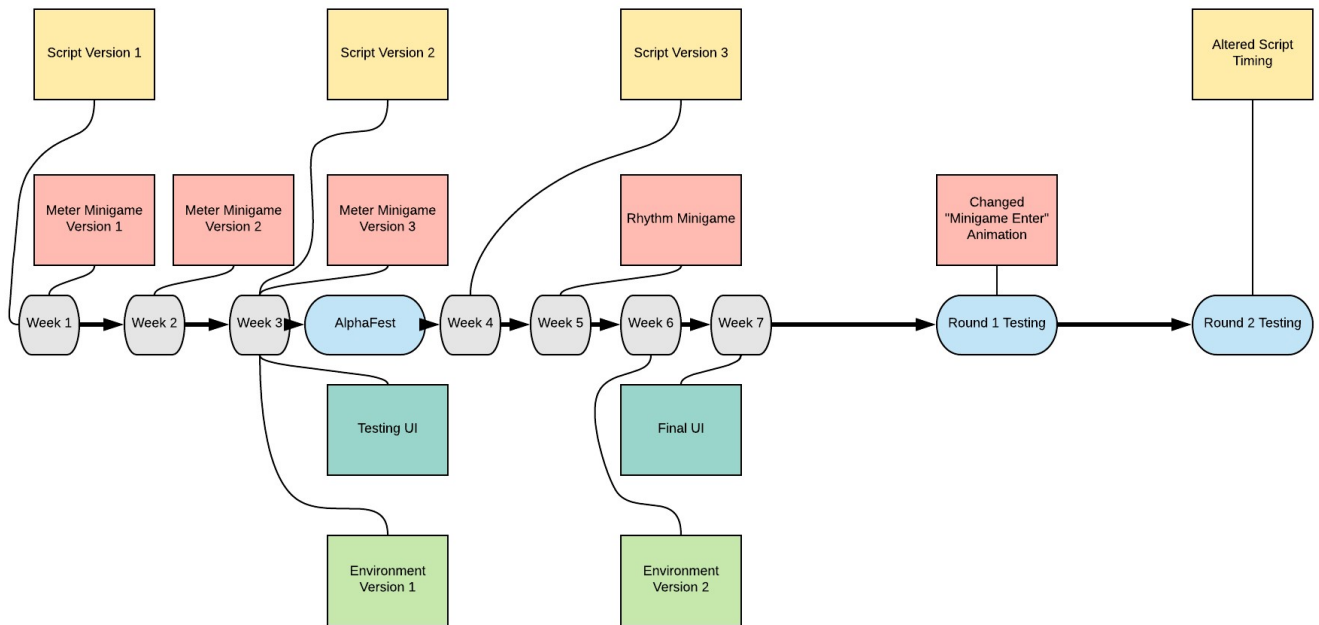


Figure 14: Development process timeline

The bulk of *Bound* was designed and developed in seven one-week long iterative cycles (Figure 14). In the middle of this development cycle there was one playtesting session conducted at WPI's AlphaFest event. This opportunity provided a chance to test my initial concept and informed many of the design decisions made during this time period. Following the seven-week development cycle was a seven-week testing period. Which consisted of three rounds of playtesting. Each round of testing was two weeks long, one week for the actual testing and one week to tune the content of the game. The third round served as summative evaluation, and therefore, was not followed by a week of tweaking. This section details all design alterations that were made during the initial development cycle and testing cycle. In general, the goal of these changes was to strengthen the communication of the game's controls and the impact of the narrative.

Narrative Design

It was important to me that story of *Bound* was told from the perspective a transgender man. It wouldn't be as impactful for the narrative to be centered on binding and only feature the voice of a cisgender character. Additionally, I only intended for the game to be a few minutes long, so I didn't want to overwhelm the player with an abundance of dialogue. I did, however, need to convey the appropriate amount of information to the player so their actions make contextual sense and also get them emotionally invested. The story has remained linear since it's conception with no opportunity for player agency.

I first started developing the game around the idea that the full experience only took place at the school. Players were dropped immediately into the parking lot and then left to their own devices while the narration played. However, because players weren't aware that it was impossible to "beat" the minigame, they felt as if they should play again to try and "do better." This is exemplified in the "Testing" chapter under the "AlphaFest" section. The purpose of this game was not to challenge someone's mechanical skill. So, in order to curb the expectations of the player, I situated the event as a flashback.

In the beginning and end of the final version, the player character finds himself in a hospital, telling a doctor why he had passed out. Not only did players expect to "fail" the scenario somehow, but it provided an opportunity for me to comment on the healthcare system and my personal experience with its lack of empathy for transgender patients. It also gave the game a sense of closure, being able to end on that same conversation.

Script Evolution

First Version

1. *"Do not under any circumstances, wear for more than eight hours a day."*

2. *"Do not wear during strenuous physical activity."*
3. *That's what the package told me.*
4. *Then, later when I googled it, the internet told me the same thing.*
5. *So, I said "Fuck it!" and now I'm here. Where I went to middle school like... Eight years ago.*
6. *Wearing this binder that I'm not supposed to and running shoes that I haven't touched since I came out.*
7. *Everyday after lunch, I used to fly down this sidewalk and up those stairs to the track.*
8. *My friends were never able to catch up with me so they would just lean back on the chain link fence and watch. Flashing me a thumbs up when I blew by.*
9. *I want that again. So badly.*

This preliminary script establishes important information about the player character, but lacks the specificity that may make it more accessible. The sixth line confirms that the player character is wearing a binder, however, it does not specify a *chest* binder. A transgender man is saying this line, it would be out of character for that individual to not simplify the article of clothing to just “binder.” The sixth line also confirms that the player character “came out.” Again, another instance in which this script is vague. I made this decision for a similar reason. To use the phrase “came out as transgender” is awkward and uncharacteristic. I assumed that the player would be able to piece together the player character’s gender identity because of the fact they were wearing a binder. Lines seven through nine suggest that the player character had an athletic history and enjoyed running.

While the appropriate information was conveyed without being too direct, this version had two weaknesses. The first was that the passion for running seemed to be an afterthought, located at the end the end of the narration. If a player wasn’t already predisposed to enjoy running, they may feel a disconnect between their personal experience and the one portrayed in the game. The second problem was that the narration didn’t foreshadow anything that was going to occur. The player might feel as though they could still somehow “beat” the running minigame.

Second Version

1. *Everyday after lunch, I used to fly down this sidewalk and up those stairs to the track.*
2. *My friends were never able to catch up with me so they would just lean back on the chain link fence and watch. Flashing me a thumbs up when I blew by.*
3. *I want that again.*
4. *"Do not under any circumstances, wear for more than eight hours a day."*
5. *"Do not wear during strenuous physical activity."*
6. *That's what the package told me.*
7. *Then, later when I googled it, the internet told me the same thing.*
8. *So, I said, "Fuck it!" and now I'm here. Where I went to middle school like... Eight years ago.*
9. *Wearing this binder that I'm not supposed to and running shoes that I haven't touched since I came out.*
10. *I'm ready to be that kid with windswept hair and basketball shorts again*
- ~~11. *Everyday after lunch, I used to fly down this sidewalk and up those stairs to the track.*~~
- ~~12. *My friends were never able to catch up with me so they would just lean back on the chain link fence and watch. Flashing me a thumbs up when I blew by.*~~
13. ~~*I want that again. So badly.*~~

In this version of the script, the ordering of the lines was reworked and line ten was added. Now, the player immediately gets the sense of the player character's past athleticism and their yearning to return to it. Players who may not be keen on running themselves now can immediately adjust to the player character's passion. Line ten reaffirms that they're purpose in this scenario is to go running again, despite their physical limitations. This line also serves to suggest where they should be headed in their environment. However, this version of the script still doesn't solve the issue of curbing the player's expectations of the inevitable outcome.

Third Version

1. *DOC: Are you in any pain?*
 2. *PC: No.*
 3. *DOC: Can you tell me what happened?*
 4. *PC: I went on a run.*
-

1. *Every day after lunch, I used to fly down this sidewalk and up those stairs to the track.*
2. *My friends were never able to catch up with me so they would just lean back on the chain link fence and watch. Flashing me a thumbs up when I blew by.*
3. *I want that again.*

4. *"Do not, under any circumstances, wear for more than eight hours a day."*
 5. *"Do not wear during strenuous physical activity."*
 6. *That's what the package told me.*
 7. *Then, later, when I googled it, the internet told me the same thing.*
 8. *So, I said, "Fuck it" and now I'm here where I went to middle school like... eight years ago.*
 9. *Wearing this binder that I'm not supposed to and running shoes that I haven't touched since I came out.*
 10. *I'm ready to be that kid with windswept hair and basketball shorts again.*
-

1. *PC: But I was wearing a binder and it was hard to breathe. So, I just... Passed out.*
2. *DOC: Why didn't you stop?*
3. *PC: I don't know. I think I'm just tired of feeling helpless.*
4. *DOC: Helpless? I'm afraid that I don't understand.*

This version of the script introduces a new character, a doctor, a new hospital environment, and situates the event at the middle school as a flashback. Now at the very beginning, players know that the player character has landed himself in the hospital because of something that happened when he was running. So, when the running minigame is started, there is an established understanding that something is going to go wrong. Not only this, but it allowed me to convey the player character's frustration with his body in line 3 of the ending segment and the medical community's general lack of empathy towards transgender patients in the final line.

Final Version

1. *DOC: Are you in any pain?*
 2. *PC: No.*
 3. *DOC: Can you tell me what happened?*
 4. *PC: I went on a run.*
-

1. *PC: Every day after lunch, I used to fly down this sidewalk and up those stairs to the track.*
2. *PC: My friends were never able to catch up with me so they would just lean back on the chain link fence and watch. Flashing me a thumbs up when I blew by.*
3. *PC: I want that again.*

4. PC: *"Do not, under any circumstances, wear for more than eight hours a day."*
 5. PC: *"Do not wear during strenuous physical activity."*
 6. PC: *That's what the package told me.*
 7. PC: *Then, later, when I googled it, the internet told me the same thing.*
 8. PC: *So, I said, "Fuck it" and now I'm here where I went to middle school like... eight years ago.*
 9. PC: *Wearing this binder that I'm not supposed to and running shoes that I haven't touched since I came out.*
-

1. PC: I'm ready to be that kid with windswept hair and basketball shorts again.

1. PC: *But I was wearing a binder and it was hard to breathe. So, I just... Passed out.*
2. DOC: *Why didn't you stop?*
3. PC: *I don't know. I think I'm just tired of feeling helpless.*
4. DOC: *Helpless? I'm afraid that I don't understand.*

The only thing that was altered in the final version of the script was the chunking of the lines. The transition from the player leaving the exploration portion of the game to the running minigame was switched from a camera animation to a fade in and out of black. The camera animation was identified by playtesters (see the Round 2 section in the "Testing" chapter) as awkward and jarring. In order to make the black screen feel more organic, I chose to play the last voice line in the exploration section of the game over it. This would partially prime players for the minigame and make it clearer how much time had passed while the screen was black.

Minigame Design

Bound's minigame has taken two main forms over the course of development; a key smashing meter management activity and a rhythm game. The idea was to task the player with an activity that is both physically and mentally strenuous to mimic the turmoil of the player character. At the heart of both forms is the idea of being required to press the correct sequence in rapid succession. This is because it was the most physically laborious task to do with a keyboard that I could brainstorm.

Meter Management System

The original concept for *Bound's* minigame was to be centered around the vigilant management of three separate meters; one that represented the player character's oxygen level, one that represented the player's speed, and one that represented the player's consciousness. Over time, the meters would change. The character would gradually pick up speed. As the player ran faster, their oxygen level would deplete. The lower the character's oxygen, the faster the character loses consciousness. The longer that the minigame went on, the faster these meter values increased or decreased.

In addition to keeping track of the levels of the meters, the players are faced with two constant prompts. A "pace" prompt and a "breathe" prompt. The "pace" prompt cycled randomly through a pool of "W," "A," "S," and "D" keys. When the player hit the key that was displayed by the prompt, the player character's speed would be reduced, also reducing the speed meter. The "breathe" prompt cycled randomly through the arrow keys. When the player hit the key that was displayed by the prompt, their oxygen and consciousness would increase. The "breathe" prompt was on a cooldown timer so that attention had to be paid to both prompts.

Evolution

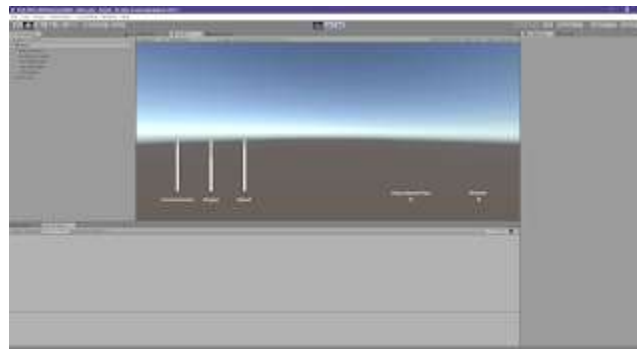


Figure 15: Screenshot of the first iteration of the minigame

The very first whitebox of the minigame mechanic is shown in Figure 15. The pace keys were "W," "E," and "R" while the breathe keys were "B," "N," and "M." This key selection proved to be incredibly unintuitive. The average player does not know the location of all keys on the keyboard. In addition to this, the key prompts were too far away from the meters. The prompts demanded all the players attention, affording them almost no time to notice the current levels of each meter.

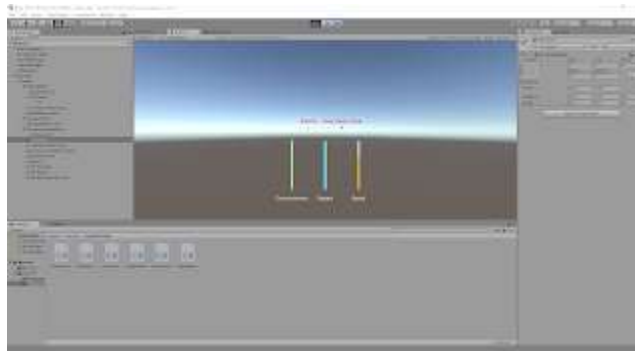


Figure 16: Screenshot of the second iteration of the minigame

The next iteration, Figure 16, was much more successful in terms of information accessibility. The player's focus is drawn directly to the center of the screen. The proximity of the key prompts and the meters makes the meter levels easier to observe. The color of the meters helps to differentiate them and associate them with what they represent. The pace and breathe keys had also been changed to the "WASD" and arrow keys, the most common control scheme used for movement in computer games. This meant that their locations are familiar. However, the placement of the pace and breathe prompts were opposite of where a player would put their hands on the keyboard.

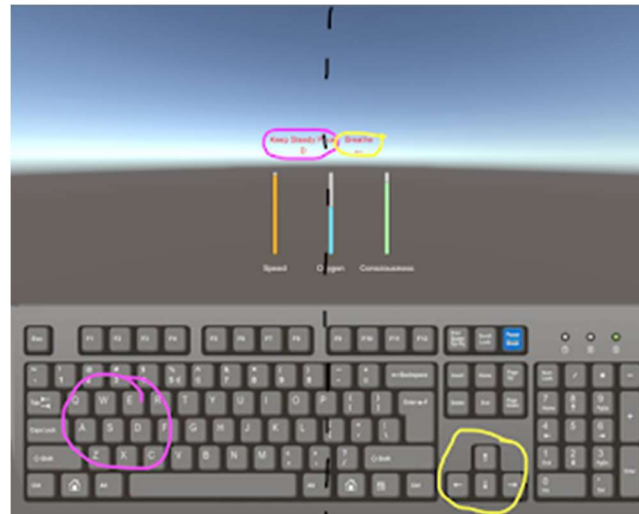


Figure 17: Physical mapping diagram of meter minigame

The final iteration of this whitebox, Figure 17, was amended to reflect the physical layout of the input device. Overall, this decreased the difficulty of the mini-game because players no longer had to account for the inverted mapping of the prompts.

After AlphaFest playtesting, it became apparent that there was too much information being presented to the player at once (see the AlphaFest section in the “Testing” chapter). Players would sometimes become so focused on the pace key prompt that they were unable to check the meters to get a sense of their performance. Even after the UI elements had been centered on the screen. Most players didn’t realize that there was even a second prompt for breathing. Most importantly, because of the lack of feedback, players weren’t certain how successful or unsuccessful key presses were affecting the meters. The consensus that this iteration of the minigame was confusing because the controls were not being effectively communicated. The confusion was detracting from the emotional impact that was important for my game to make. So, I drastically reimagined the minigame to fit a format that closer to what other players might be familiar with; the rhythm game.

Rhythm Game

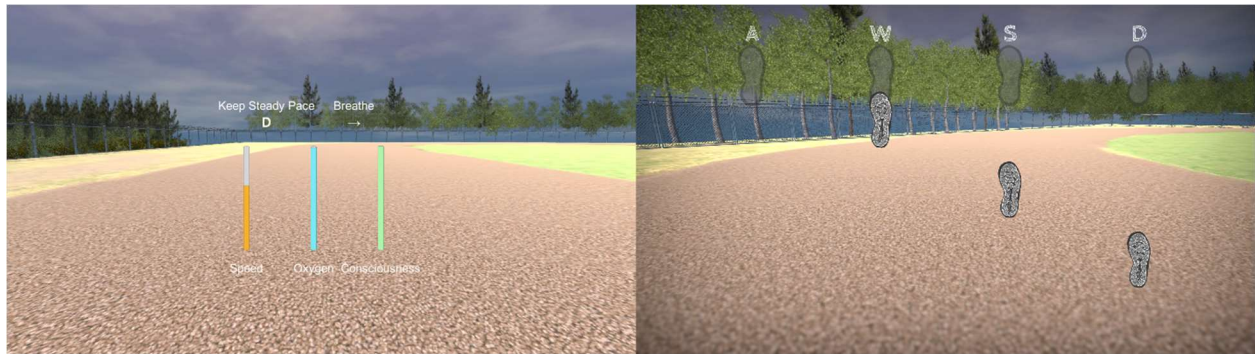


Figure 18: Comparison of meter style minigame (left) to rhythm style minigame (right)

This iteration of the minigame solved the issue of confusion surrounding the mechanics. Rhythm games are a well-known genre, thanks to the popularity of games like Rock Band, Guitar Hero, and Dance Dance Revolution. Most players can immediately recognize their format when presented with it. They could infer that the prompts traveling up the screen were associated with the corresponding letter featured on the receiver (version comparison shown in Figure 18). In playtesting sessions, players would usually make one mistake within the first five seconds of the game before fully grasping their objective (See the Round 1 section in the “Testing” chapter).

UI Design

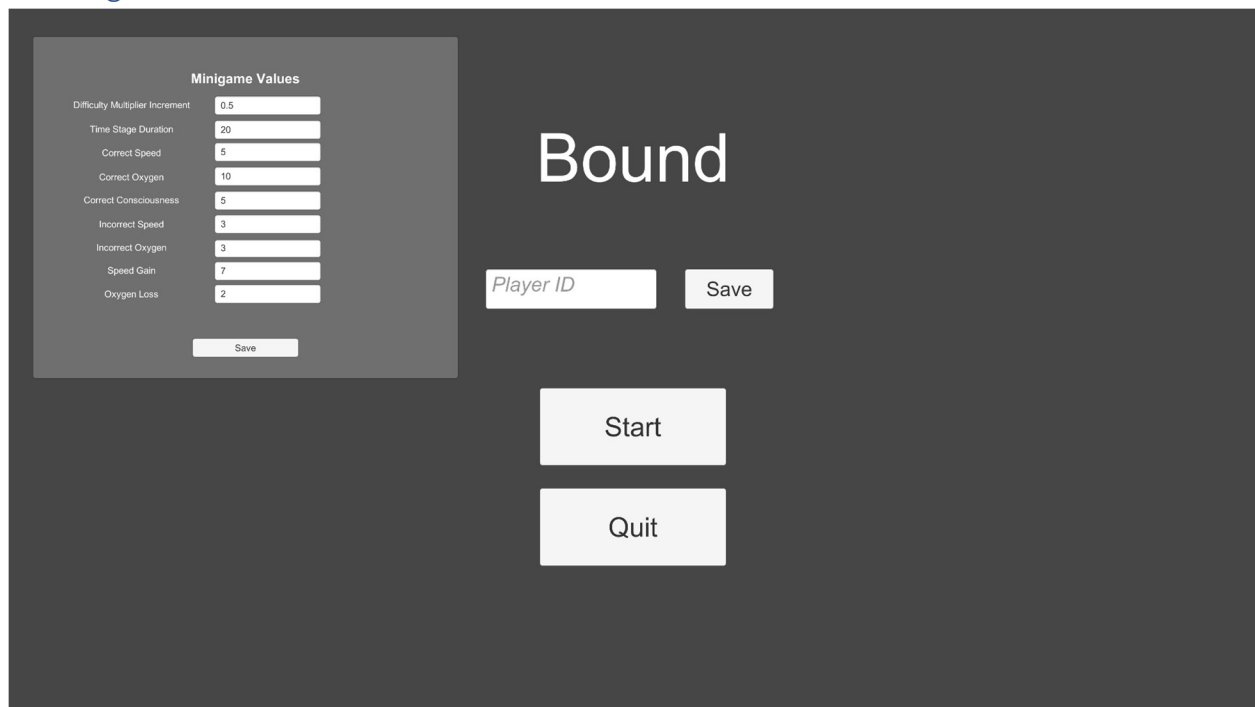


Figure 19: Early version of Bound's main menu

For the majority of the seven-week development cycle, *Bound's* UI was purely functional (Figure 19). It served no purpose other than to capture and test new minigame values, record player IDs, and get players into the game as quickly as possible. It wasn't until after the script had reached its third version and the environment had been sufficiently fleshed out that I began to think about UI design and art style. The color scheme was heavily influenced by my narrative design process. Because the beginning and ending of the game occur on black screens, it made sense to continue the theme of the black background on the main menu. This way, the transition to the start of the game would not feel jarring or empty.

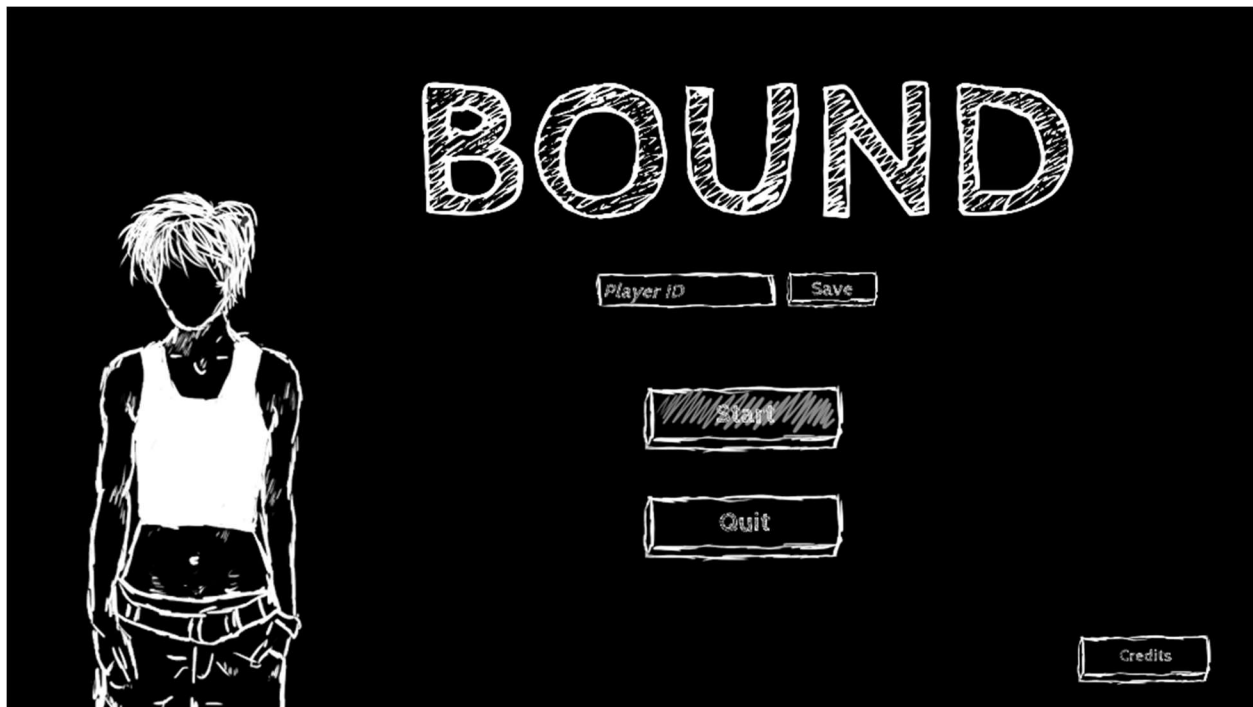


Figure 20: The final version of Bound's main menu

As discussed in the UI Design section of the “Final Game and Experience Design” chapter, the main menu is the only location where the player can see a physical representation of the player character (Figure 20). Originally, I was hesitant to include one because then I would have to tactfully consider gender expression. I didn’t want to perpetuate any stereotypes about the appearance of transmasculine people. However, I needed some way for players to associate the word “binder,” which is mentioned in the narration, with a chest binder. People who aren’t primed with this visual imagery might associate the word “binder” with school supplies. I wanted to prepare players to think differently by including the sketch of the protagonist wearing a chest binder on the main menu screen. I chose not to include the facial features of the protagonist and make them appear athletic and androgynous in the sketch. I did this to avoid perpetuating the previously mentioned stereotypes.

This sketch of the protagonist really informed all the other UI elements featured in the game. The button outlines are sketched in the same fashion as the representation of the protagonist. The font was selected based on its similarity to the style. The minigame prompts and receivers were also created with the exact same process as the sketch. It served as the focal piece which everything else was organized around.

Environment Design



Figure 21: View of BHMCPs from secondary parking lot

Bound's location is heavily inspired by the middle school that I attended for sixth and seventh grade due to its autobiographical nature (Figures 21, 22, and 23). Back then, it was called Barnstable Horace Mann Charter Public School, or BHMCPs for short. Today, it's Barnstable United Elementary school, educating fourth and fifth graders. It features a large public track and field that are enjoyed by the community as well as the students during recess. The school is located on Cape Cod, Massachusetts where I grew up. This place symbolizes a milestone in my journey of embracing my identity as a transgender man.



Figure 22: View of public track from secondary parking lot

BHMCPS used to run an afterschool sports program. I had always wanted to learn how to play lacrosse and noticed that was one of the choices in the program. I persuaded my parents to sign me up and eagerly awaited the first day of practice. The other kids in the program were older than I was and the instructors were not associated with the school. No one knew my identity. I have always been very masculine. All of my clothes were from the “boys” section of K-Mart and my hair was cut short. I was almost always read as male. So, naturally, everyone in the program referred to me as one of the boys. They used “he/him/his” pronouns and called me “Billy” (something that sounded close to my birth name). It was the first moment where I didn’t have to worry about the reactions of my friends or my parents

when someone “misgendered” me. It was the first time that I could experience living as a man and I realized how comfortable it felt.

It's important to note that most, if not all, of my player base will not have attended this school or be familiar with this physical location. This is a fact that does not matter when people play the game. It is only vital that players interpret this environment as a middle school for their actions and the narrative to make sense. My focus on this specific place is for personal and sentimental reasons only.

Art



Figure 23: BHMCPs public running track

In creating the digital environment, I attempted to stay as close to the physicality of BHMCPs as possible. However, because of my lack of experience in making 3D art assets, all 3D assets that are implemented in the game were found on Unity's Asset Store for free or for very cheap. I did not have the opportunity to work with an environment artist due to the financial and logistical constraints of the project. This meant that I was not able to accurately recreate the structures themselves. Therefore, I favored assets that were modular so that I could use

them to properly recreate the proportions of the space and maintain a consistent visual style. Since players were not familiar with the location, this scrupulous attempt to stay true to the original location likely had no measurable impact on the game's overall design or message.



Figure 24: Comparison of BHMCPs exterior layout (left) to Bound's layout (right) (2019) [18]

During the seven-week development period, I returned to Cape Cod to BHMCPs. I took several photos of the building, the parking lot, and the public track to use as reference images while I was constructed the digital version. There are many instances where my recreation of BHMCPs differs from the actual location (comparison shown in Figure 24). BHMCPs is shaped like a square with a garden courtyard in the center. In my recreation, it has been simplified to one long rectangular building. Because players are not, at any point in the experience, entering the school I didn't spend the extra time and resources to recreate the courtyard. BHMCPs also has very distinctive architecture and an irregularly shaped parking lot that I was not able to replicate with my free modular assets. The one aspect of this environment that is acceptably similar is the track. In both the digital and physical location, there is a stairway leading up to a raised, level piece of land. The track is enormous, circling an entire football field. While no aspect of the environment is an exact representation of BHMCPs, it passes as a school parking

lot and public track. This is key for players to understand what's happening in the game and be impacted by its message.



Figure 25: Second screenshot of Bound's environment

Figure 25 is a shot of *Bound's* final environment in the Unity game engine. It consists of three major components; the school building, the public track, and the parking lot. Each area is decorated with various props and foliage to make the space feel less sparse. For example, the buses parked behind the building, the garden island in the parking lot, and the parking space lines on the pavement. It is completely surrounded by a ring of trees to communicate an impassible barrier to the player. Players cannot enter the school building itself, they can only explore its exterior. As soon as they navigate to the top of the staircase, the running minigame begins and they can no longer return down to the parking lot.

I chose to augment the game's main camera with a post processing effect. The majority of the gameplay is situated as a memory. There needed to be something that distanced the

player from what was happening. So, there is a very slight vignette effect implemented on the main camera. This effect can be seen in Figure X and any other screenshot of the final game previously included. By creating a faded black border around the screen, it distances what the player is seeing from reality. This is further intensified when the vignette effect grows as players make mistakes during the minigame to illustrate the player character's loss of consciousness.

Sound

The physicality of BHMCPs also informed *Bound's* sound design. Many of the sounds implemented in the current version of *Bound* were recorded on-site in the school's parking lot. Samples that were unusable were replaced with free clips found on "freesound.org." The music is original, and all voice acting was recorded and directed by me. I used a Samson C01U Pro microphone as my recording device, Audacity to do all of my audio editing, and MAGIX Music Maker to compose the music. This section discusses the sounds implemented in the final game and the process of their creation.

Sound Effects

UI

I reinforced the sketchy 2D art style of the graphics on the main menu with UI sound effects. Holding the mouse over a button highlights it with a dark grey scribble. To make players feel as though the player character themselves was scribbling the highlight color, I implemented a literal scribbling sound effect. To produce this sound, I recorded several samples of me scribbling on a sheet of multimedia paper with a mechanical pencil. I eventually selected the sound that was shorter in length and the least aggressive sounding. When a button is clicked, a page turning sound effect is played. To capture this effect, I shook the piece of

paper in front of the microphone. I selected the sound that, again, was the shortest in length and sounded the most like turning a page in a journal.

Gameplay

In the game's environment there are several sound effects that play. Most of these sound effects are part of Unity's "First Person Character" asset pack. These are the footstep sounds that play when the player walks and the jumping sound when the player hits the space bar. Their implementation is not modified from the "prefab" that's included in the package. This means there is slight pitch and volume variance in the footstep and jump sound effects each time they occur.

Before the player is able to interact with the environment and after they listen to the beginning conversation at the hospital, there is an ambient sound sample that plays. It's the sound of a car running, then turning off as the keys are being taken out of the ignition followed by the sound of the keys being placed in the cup holder and the car door opening. For this sample, I recorded a sample of turning my car on and off in the BHMCPs parking lot, placing the keys in the cup holder, and exiting the car.

The minigame has its own slew of sounds that help immerse the player in the experience of running and provide them with feedback. There is a heavy breathing sound effect that plays on a loop while the player is running around the track and a sharp breathing sound that plays when an incorrect key is pressed. The first proves to reinforce to the player the actions of the player character and the second is to give immediate and visceral negative feedback. These sounds were recorded on location at BHMCPs. The heavy breathing was recorded after I ran two laps around the public track and just turned on the microphone. The sharp breathing was not as natural. I just mimicked sharp and painful sounding inhales sitting in

my car in the parking lot of BHMCPs. I used the closed space to block sounds from the street or the wind.

Music and Ambience

In the final version of *Bound*, there is one music track that loops while players explore the environment and plays the minigame. It consists of piano, sparse percussion, and a variety of synths. It is designed to evoke a sense of sadness and nostalgia. The track starts with piano chords played on the downbeat with no other instruments or sounds. As it continues, other instruments are layered in, first the percussion, then swelling synths. The end of the sample is punctuated with a light, staccato, synth melody meant to symbolize the shimmer of joy and freedom that the player character feels while running. When the track loops from that melody to the somber, bare piano chords, the melody's absence is palpable. The song came together over the span of one evening as I experimented with different combinations of instruments and riffs. I knew that I wanted something minimal in instrumentation and simple in melodic complexity. I didn't want the music to be so busy that it distracted from the experience. I ultimately settled on the piano as the driving component of the song because I found the constant striking of chords to be powerful and emotionally moving.

There are also two tracks of ambience that play in *Bound*. The first is during the black screens at the beginning and end of the game, the second is in tandem with the music while the player is exploring their environment. The first includes the steady beeping of a heartrate monitor and the hum of hospital equipment while the seconds includes wind, insects, and birds. In both cases, their purpose to make the location feel more real. In fact, it is purely the ambience that communicates where the player character is currently located during the

hospital scenes. These tracks were created from editing sound clips scavenged from “freesound.org” and from atmospheric samples taken at BHMCPs.

Voice Acting

Bound features two voice actors; myself as the player character and my step father as the medical professional. With the recent controversy surrounding celebrities like Scarlet Johansson, a cisgender woman, being cast as a transgender man, I wanted the voice of the player character to be as authentic as possible. It’s incredibly important that these roles and opportunities are given to people who belong to the community that they’re portraying. Especially when those communities are significantly underprivileged. I chose to fill the role because of its alignment with my identity. It was also a decision born from convenience because I did not have to schedule my time around another person and I was the most familiar with the game’s emotional direction. My step father filling the second role was partially due to the convenience of living in the same house. However, it was also because I was looking for the voice of a middle-aged man. I deliberately chose to have these lines voice acted rather than just appear as text on a screen. It was important that players associate the character with something human to increase the emotional impact of the overall experience.

Technical Implementation

The technical design for *Bound* is driven by five managers and an event system. The five managers are as follows; the GameManager, the AnalyticsManager, the DialogueManager, the SoundManager, and the UIManager. Each manager follows a singleton design pattern. The most important manager is the GameManager which keeps critical information about the current state of the game and is the only script that fires gameplay related events. All other managers listen for these specific events and then manipulate the information relevant to them. For example, when the player walks up the stairs to the track, they step into a trigger box that causes the GameManager to invoke an event. The UIManager then, in response to the event, pulls up the UI associated with the minigame. Other game objects in the Unity scene that needed their own individual behaviors outside of the event system were attached with controller scripts. The managers and their relationships can be visualized in Figure 26, which contains a UML diagram of the entire project.



Figure 26: UML Diagram of the entire game

Dialogue

The functionality for the dialogue text exists in two C# scripts. The `DialogueManager` and the `DialogueTextController`. In general, the manager handles the lines themselves while the text controller prints the next line to the screen.

The `DialogueManager` is a singleton which is responsible for maintaining the individual lines in string arrays. I opted not to read text from an external file because of the brevity of the game's narrative script. That script is broken into four chunks based on when the lines occur in the game. There is the introduction dialogue which contains the first hospital conversation, the pre-minigame dialogue which plays while the player explores the school environment, the priming dialogue which occurs during the fade between the exploration and the minigame, and the post-minigame dialogue which contains the final hospital conversation. The manager contains the lines for the scripts, in order, in four arrays that represent these categorizations. This manager also contains functions for returning the next line of dialogue.

The `DialogueTextController` is a script that is attached to the Dialogue Text UI element in the Minigame Canvas. In order to print the correct line of text to the screen, this script needed a way of knowing what section of the game players are currently in. So, it contains a list of flags that are flipped when different events are fired by the `GameManager`. These four flags correspond exactly to the categorizations in the `DialogueManager`; `isIntro`, `isPreMinigame`, `isPriming`, and `isPostMinigame`. When one of these flags is flipped, the text controller tells the `SoundManager` to play the next dialogue clip. It then stores the length of the clip to use as a timer and writes that line of dialogue to the screen for the length of time indicated by the clip length. The text controller checks each new line to see if it's the end of that categorization of lines. If that's the case, then the corresponding category flag is

set back to false and the appropriate transitional functions are called. For example, after the post-minigame text is displayed, the game is over and the scene needs to be reloaded in order to reset all important values.

Sound

The `SoundManager` is the script that has references to all of the audio sources in *Bound* and functions to control them. *Bound*'s main scene has an audio source for each sound effect and music/ambience track. The only audio source that has multiple audio clips swapped in and out of it is the Dialogue audio source. I chose to implement the audio system this way because there are multiple sounds that need to be playing over each other. For example, while players are in the running minigame, the breathing sound effect needs to be looped over the running sound effect which is playing over the music. If I was only using one audio source, that wouldn't be possible. It's typically bad practice for a large-scale game to implement an audio source for individual sounds because Unity can only support a finite number of audio sources playing in tandem. However, I'm only using eight sounds in addition to the dialogue clips. It was more convenient to implement it this way because I didn't have to worry about switching audio clips in and out of multiple audio sources.

The `SoundManager` consists of functions that can be called to play specific sounds. Most of these functions are tied to events that are fired by the `GameManager`. For example, when a player hits an incorrect key, the `GameManager` fires the `ConPenalty` event. The function that plays the sharp breathing sound effect through its audio source listens for that event and executes. This manager also stores an array of dialogue audio clips in the order that they're read. To keep track of which dialogue clip is next to be played, it also stores an index in

the form of an integer. There is a function which plays the dialogue clip at the current index by swapping it into the audio source and then increases the index. The `DialogueTextController` is responsible for both displaying the appropriate text on the screen and calling this function to play the corresponding clip. That same controller accesses another one of the `SoundManager`'s functions which returns the length of the dialogue clip that is currently located in the dialogue audio source. This is so that controller can know how long it needs to display the text.

Another functionality that this manager has is manually fading some audio sources out. Unity's audio API doesn't provide a function that does this. I didn't want the minigame to end so abruptly and have the background music cut out; that would be jarring for the player. So, I developed a custom implementation. There are flags for all audio sources that need to be faded out (running, breathing, music, and hospital ambience) which, when set to true, begin to decrease the volume level of the audio source every update step. The flag is reset to false once the volume level of the audio source reaches zero.

UI

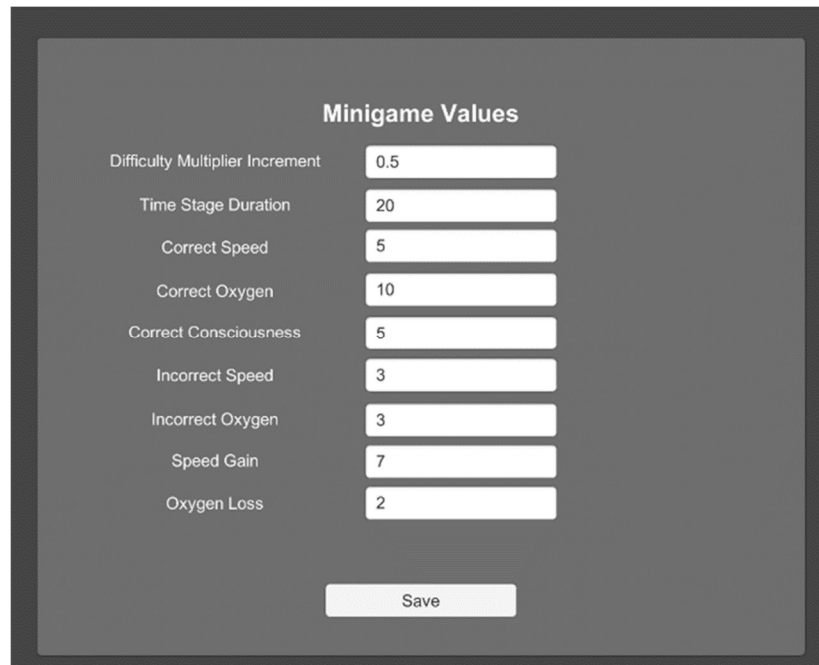
The `UIManager` is responsible for keeping references to all of the UI canvases. In Unity, a canvas is just a properly formatted container for a variety of UI elements. *Bound* utilizes only one Unity scene for all of its screens and gameplay. UI elements are grouped into separate canvases; the main menu has its own canvas, the minigame has its own canvas, the credits have their own canvas and there is also a canvas for the black screen. All of these canvases start as "inactive" and are set to "active" by the `UIManager` depending on the current state of the game. The manager does this by registering a set of functions to events that are fired by the

GameManager. These functions are called in other scripts at the appropriate time depending on the situation. For example, when the player triggers the minigame, the GameManager fires the MinigameStart event. The UIManager has a function which sets the minigame canvas to active listening for that event, so the function executes.

The UIManager is additionally responsible for functions that react to button presses. For instance, saving the player's UserID to the AnalyticsManager. It has a function which takes the text in the input field from the user and feeds it to the AnalyticsManager which is called when the "save" button is pressed. It also "activates" the credits canvas when the "credits" button is pressed.

Fading the entire screen to black is an effect that Unity does not provide in its API. So, I implemented it with a UI canvas which contains only a black image. The manager contains a function which references the black image in that canvas and uses the CrossFadeColor function to gradually fade it in and out via its alpha channel.

Testing



Minigame Values	
Difficulty Multiplier Increment	0.5
Time Stage Duration	20
Correct Speed	5
Correct Oxygen	10
Correct Consciousness	5
Incorrect Speed	3
Incorrect Oxygen	3
Speed Gain	7
Oxygen Loss	2

Save

Figure 27: Test value input panel in early main menu configuration

In early iterations of the game when I was testing different values for minigame difficulty, I needed a quick way to manipulate these values during play sessions. So, I made a new panel within the main menu canvas which contained input fields for every variable associated with the minigame, shown in Figure 27. When the game started, it would pull the current values from the GameManager and display them in the input fields, those values could be manually modified and saved for that play session by clicking the “save” button in the panel. All of this functionality was inside of the UIManager, tied to the Start function and another function which set the variables in the GameManager. This was a much faster way to evaluate which variables were most important in contributing to mechanical difficulty. However, as soon as I identified base values for the minigame variables, I removed this feature all together. Excluding it made the main menu look more polished and less cluttered.

Gameplay

Bound's gameplay functionality can be divided into two parts; the exploration movement and the rhythm minigame. The movement system relies almost entirely on the First-Person Character asset pack provided by Unity. The minigame code exists in several scripts; the GameManager, the MinigameTriggerScript, the receiver and prompt controller scripts, the KillZoneController, the RunAnimationController, and the VignetteController.

Movement System

The exploration portion of the game is where the player manipulates the character to navigate the middle school environment. The player does this in a first-person fashion with the mouse and WASD or arrow keys; similar to games such as *Gone Home*, *The Vanishing of Ethan Carter*, or *The Stanley Parable* [14, 5, 30]. Additionally, they can sprint by holding down the shift button while moving and jump by pressing the space bar. All of these controls are handled by the FirstPersonController script which is attached to player character's game object. This FPSController game object was provided as a prefab by one of Unity's default asset packages. This same script also plays the appropriate sound effects while the character is walking, running, or jumping through its own audio source. To prevent the player from being able to walk entirely off the map, I implemented a series of box colliders. The main camera of the scene is also attached to the FPSController game object which is manipulated by the FirstPersonController script when the player moves their mouse.

Minigame

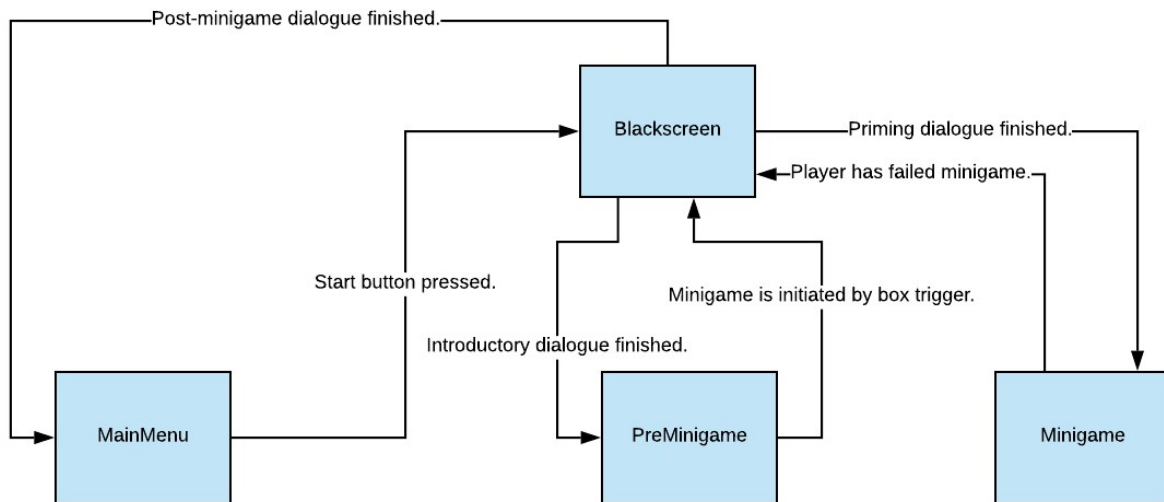


Figure 28: Bound's state diagram

The minigame section begins when the player walks over a box trigger located at the top of the stairs to the track. The script attached to the box trigger, signals to the GameManager that it's time for the minigame sequence to begin. After the priming dialogue has played and the game has faded back in from black, the running animation and rhythm game prompts begin.

The animation of the player character running was created manually in Unity's animation system. Each key frame was made by physically dragging the player character game object around the track. This animation is stored as an animation state in that game object's animator. When the game starts, the animator component of the player character game object is set to inactive. When the event `MinigameStart` is fired by the GameManager, the `RunAnimationController` plays the animation through the animator component.

The UIManager is responsible for setting the minigame canvas to active. However, it's the GameManager that spawns new prompts, tracks player minigame progress and

performance, and fires all necessary events. All of the values that are associated with the minigame are dependent on what the `currentTimeStage` is. The `GameManager` has a timer that sets itself to the desired time stage duration (in this case, eight seconds). When that timer reaches zero, the `GameManager` increases the time stage and modifies all dependent minigame values. These values include prompt spawn cooldown and prompt speed.

When a prompt is spawned it checks what the `GameManager` for what the current prompt speed is to set its own travel speed. This scripts also contain a function to destroy itself when the player hits the correct key.

Each prompt receiver is also fitted with its own script controller. These scripts handle collision with prompts, key inputs and the visual feedback that is given to the player on those key inputs. Collision with the prompt script is handled by checking two flags. The prompt controller contains the `isColliding` flag which is set to true when the prompt enters the trigger collider of the receiver. The receiver itself sets this flag and also sets its own `isValid` flag to ensure that there is a prompt on top of it. For example, when the player presses the “W” key, first the receiver controller script checks the `isValid` flag. If this flag is false, it means that there is no prompt within the trigger collider of the receiver. The script signals to the `GameManager` to fire the `ConPenalty` event and then logs the incorrect key press with the `AnalyticsManager`. If `isValid` is true, it means that there is a prompt in that receiver, and it’s a correct key press. It signals to the `GameManager` to fire the `CorrectWKeyPress` event and then logs the correct key press with the `AnalyticsManager`. The previously mentioned deletion function that exists in the prompt controller script is listening for the `CorrectDKeyPress` event to delete itself. Each key has its own event correct key press event.

The receiver controller also handles visual feedback. It contains a set of three functions; `GoodKeyPressAnim`, `BadKeyPressAnim`, and `ReturnToOrigin`. The first function manipulates the game object's image color to cyan and scales its `RectTransform` up by twenty percent. The second function manipulates the game object's image color to red and scales its `RectTransform` up by twenty percent. The last returns the image of the game object to its original color and scale. Both `Anim` functions are fired when the prompt controller detects either a good or bad key press. When the key has stopped being pressed, the `ReturnToOrigin` function is called. Initially, I had tried implementing this feedback using an animation created in Unity's animation system and triggering it via an animation trigger key word. However, there was a significant lag between when the player hit the key and when the animation executed. So, I opted to manipulate the color and scale parameters directly in the code for instantaneous execution.

Another aspect of the minigame is the kill zone. This is an invisible trigger collider located at the top of the screen that spans its entire width. It is attached with a `KillZoneController` script which detects collisions with prompts. When a prompt collides with the kill zone it means that the player failed to press the correct key to clear it. So, the script signals to the `GameManager` that the `ConPenalty` event should be fired. It then logs that a key has passed the top of the screen with the `AnalyticsManager` and deletes the object that's colliding with it. This is to ensure that unnecessary game objects don't stay in the scene hogging extra device resources.

The `GameManager` script, as mentioned before tracks all of the values that the minigame is dependent on. The value that is most important to player performance is

`currentConsciousness` which can be thought of as the player's "health." At the start of the game, it is set to 100. Every time the `ConPenalty` event is fired, either by the prompt controller colliding with the kill zone or by the receiver controller detecting an incorrect key press the `currentConsciousness` is reduced by twenty. That value reaching zero signifies the end of the minigame and the `GameManager` reacts accordingly by changing the game's state and firing the `EndBlackScreen` event.

The `VignetteController` contains a reference to the post processing effect profile that is attached to the main camera. It controls the intensity of the vignette effect as the minigame progresses. It has a function that listens for the `ConPenalty` event to be fired which sets the `isLerping` flag equal to true. When this happens, the script's update function uses linear interpolation to increase the intensity of the vignette effect. As soon as the vignette settings are at the desired intensity, the flag is set back to false. When the application starts, this script resets the vignette settings to its original intensity value.

[Analytics](#)

Implementing an analytics system to get more information about a player's interaction with the game world was vital. In summation, I used the analytics stored by the `AnalyticsManager` to keep track of the time players spent in different areas of the game and the details of their key presses. As I continued to iterate on the game this data helped me make important design decisions.

When I originally implemented the manager, I tried using an analytics SDK called "GameAnalytics." The benefit of integrating this service with my game was that it automatically tracked rudimentary data without having to alter my code and the data would exist online. It

automatically kept track of things like daily active users and average play session length. To record the specific events that I was interested in, I used GameAnalytic's API to create unique "Design Events" that could take a few parameters. The manager acted as a façade and would trigger these design events at the appropriate time when called by other managers and scripts.

Ultimately, I decided to completely abandon GameAnalytics for several reasons. First, the data would not be sent and collected if the device that it was played on didn't use an internet connection. Second, the website to view the data was not intuitive to use. It was hard to decipher how to view the custom events that I created and their occurrences across play sessions. The events that were geared much more towards tracking a commercial product were the only things that were initially displayed. Third, after the data was sent, it took at least twenty-four hours to reflect on the website. I needed to have access to that information immediately. So, I removed the GameAnalytics package from the Unity project and re-wrote the manager.

In the AnalyticsManager's current form, it still functions as a façade. However, instead of recording events to a GameAnalytics server, it writes them to a local comma separated file. I opted for this approach because it was reliable. Writing to a file is simple and I can control every aspect of what is recorded and how it's organized. Of course, a limitation would be in playtesting on machines that I do not own. However, I knew that most of the playtesting that I would conduct would be on my own devices. In instances where I sent a build of the game to someone in a different physical location, I simply asked them to send me back the CSV file after they had finished.

The `AnalyticsManager` in its current state functions as a façade. It contains a public function for every metric that can be called by other scripts and managers at the appropriate time. The majority of these functions take the metrics as parameters and then write them immediately to the CSV file. Some metric functions also account for organizational spacing that needs to be put between groupings of data by writing a number of blank lines. When the game is finished, all starting minigame values are logged to the CSV file as well as the total time that the player spent playing the game.

Metrics

Below is a list of all data tracked and reported at the end of a play session. I also identify what useful information that I can glean from that specific metric.

User ID: At the beginning of each play session a user is given a randomly generated three-digit code. They then input this code into the “User ID” field on *Bound*’s main menu as well as at the very beginning of their survey. This allows me to link that player’s survey responses with their gameplay data while still maintaining their anonymity.

Time Spent Pre-minigame: The time the player spends after they click the start button and before they trigger the minigame sequence. This suggests how much extra time they spent exploring the school environment. If they spent a disproportionately large amount of time in that location, it may suggest that it was unclear where they were supposed to go next. If players spend a disproportionately short amount of time here, it may suggest that they are not interested in the environment at all.

Starting Minigame Values: The base values for the minigame are recorded my analytics. First is the speed multiplier increment which sets how much the prompt speed increases with each new time stage. Next is the starting speed which is the base speed that the prompts start with.

Next is the starting spawn timer which is the length of time it takes to spawn a new prompt.

Next is the spawn timer decrement which is how much time is subtracted from the spawn timer with each new time stage. Next is the time stage duration or how long a time stage lasts.

Finally, is the consciousness loss which is how much is subtracted from the player's total consciousness when they make a mistake. These values are important to keep in mind when comparing data between play sessions. Players who did not start with the same base values can't be directly compared to one another.

Time spent in minigame: This is the length of time that players spend in the running minigame. This metric can be usefully compared to the time the player spent in their environment. It gives me a sense of what percentage of the experience consists of the minigame. If players don't spend a lot of time here, it may suggest that the controls were not effectively communicated or that the minigame portion was too difficult.

Total time spent: This is the time the player spends in game from the moment they hit the start button to the end of the conversation between the player character and the doctor. The game analytics does not account for the time that the player spends in the main menu. This metric helps me determine the average playthrough length across all sessions.

Key Presses: There are three different parameters that are recorded when a key is either pressed or exits the top of the screen. The "correctness" of the key press, which key was pressed, and what the time stage in that moment was. A key press is "correct" if the associated receiver successfully clears a prompt. A key press is "incorrect" if the associated receiver does not clear a prompt. A key is "Passed" when the prompt exits off the top of the screen without being cleared. In this instance, the player has not pressed a key. However, the key associated

with the prompt and the current time stage are still recorded. The current time stage is just an integer, starting at zero which represents the easiest difficulty. Key press data is only recorded while the minigame is in progress. This data gives me insight into what specific time stages begin to give users trouble. I can also see how they are failing, whether it's with incorrect key presses or the prompt flying off the screen. If people are immediately making one mistake and then none afterwards, it might suggest that mistake helped communicate the mechanics to them. If players get to the ninth time stage and then all the prompts are passed until the players fail, it might suggest that the prompts are moving too quickly.

Testing

This game underwent four separate rounds of testing. The first round was when the game was shown at Worcester Polytechnic's "AlphaFest." The game was aptly in an "alpha" state where the mechanics had not yet been definitively determined. The second and third rounds were testing for bugs, clear communication of mechanics, and the impact of the content. After both of these rounds, time was used to tweak specific mechanics or add small features in an attempt to help the game reach its experience goal. The last round of testing was to glean what the players thought about the final version of the game and to test if it accomplished what I had originally envisioned.

Methodology

Playtesters for *Bound* were collected in a variety of ways. In some instances, they would be asked to play at showcase events while the game was set up in a public place, in others they responded to a general call for testers. Testers consisted of college students on Worcester Polytechnic Institute's campus, members of the public above age eighteen, and academics. After players had signed the consent form that provided a brief description of the content of the game, players were given a random three-digit ID to serve as their "PlayerID." This ID was inputted into the "PlayerID" field on the main menu. The players then played through the entire game once and filled out a survey. The PlayerID that was entered into the game is also the first question of the survey, so that gameplay data can be linked to survey responses.

Results

This chapter analyzes *Bound's* playtesting data from all four testing sessions; AlphaFest, Round 1, Round 2, and Round 3. After examining the participant responses, it proceeds to discuss the results and make suggestions for other designers of transnarrative experiences.

Formative Evaluation

Included in this section are all of the testing rounds that informed *Bound's* design; AlphaFest, Round 1, and Round 2. Following each round of testing, the content of *Bound* was tuned based on the feedback acquired.

AlphaFest

AlphaFest was an event organized by WPI's Interactive Media and Game Design department for students to show off their projects at an early stage of development. It took place in November of 2018 and was my first playtesting opportunity. At this phase, I tested *Bound* with ten people.

Data

For this round of playtesting, I have no data about individual play sessions. This is because at this point in time, analytics were implemented using GameAnalytics instead of writing data to a local file. Technically, metrics were being recorded to a GameAnalytics server, but I did not have immediate access to that data. I also was not able to organize it in a meaningful way with their web portal. I was, however, able to collect survey responses from all testers.

When asked to give a brief description of the narrative, only five players, or fifty percent, were able to identify that the narrative involved either a transgender individual or wearing a chest binder. Six players identified that the game's narrative involved running. Three players identified that the game was both about transgender identities and running.

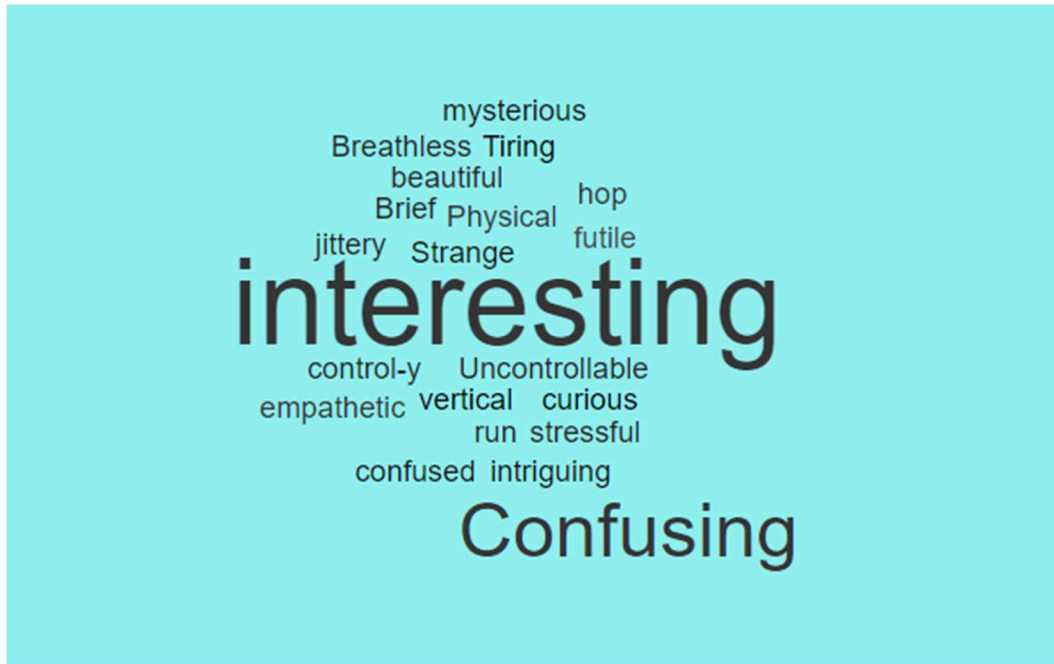


Figure 29: AlphaFest word cloud generated from survey question 3

Figure 29 is a word cloud representative of the responses to the third survey question; “Please write three words that best describe your experience in the game.” The two words repeated among multiple testers were “interesting” and “confusing” repeated three and two times respectively. Another tester also used the word “confused” to describe their experience which is notably similar to “confusing.”

When players were asked to identify anything in the game that they found to be particularly confusing, eight playtesters responded with some aspect of the minigame. Of these eight, four testers additionally identified that the prompts associated with the meters were what confused them. One playtester reported specifically, “it’s difficult to tell if you pressed the wasd properly when you have to press it twice in a row.” Every respondent was confused by at least one element of the game.

Q4 - Please rate how strongly you agree with each statement.

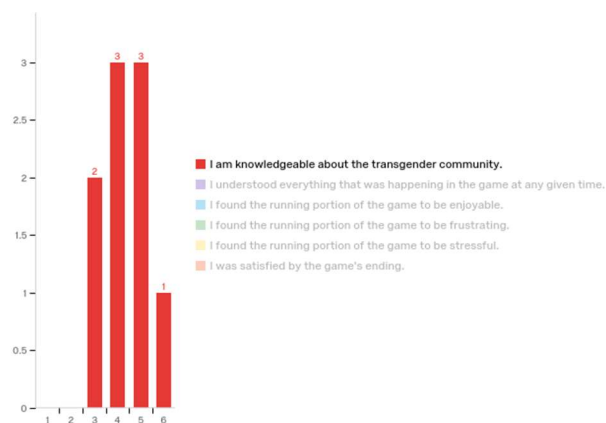


Figure 30: AlphaFest, question four, part one

Q4 - Please rate how strongly you agree with each statement.

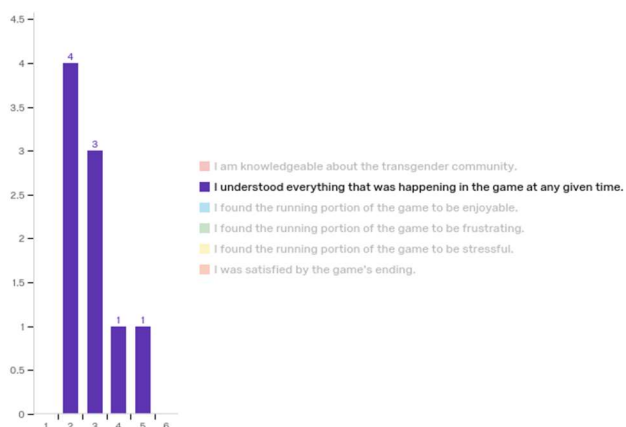


Figure 31: AlphaFest, question four, part two

Q4 - Please rate how strongly you agree with each statement.

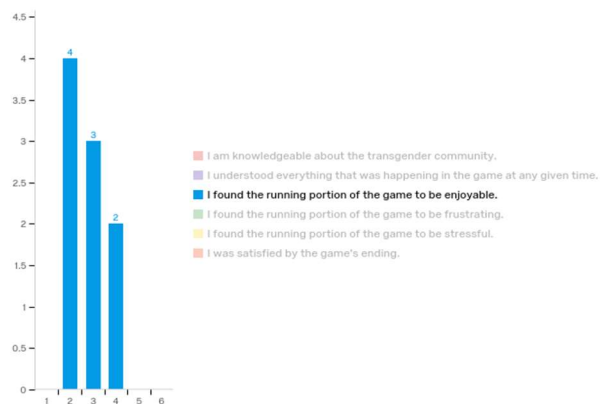


Figure 32: AlphaFest, question four, part three

Q4 - Please rate how strongly you agree with each statement.

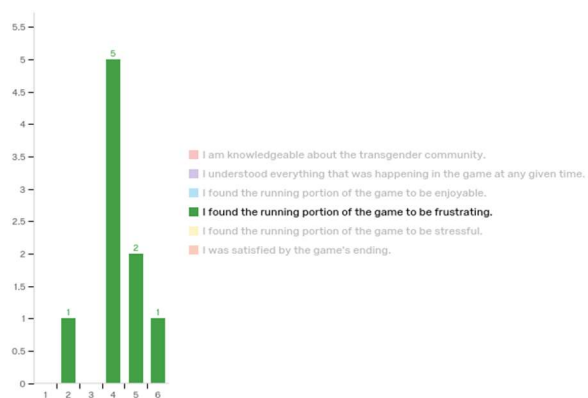


Figure 33: AlphaFest, question four, part four

Q4 - Please rate how strongly you agree with each statement.

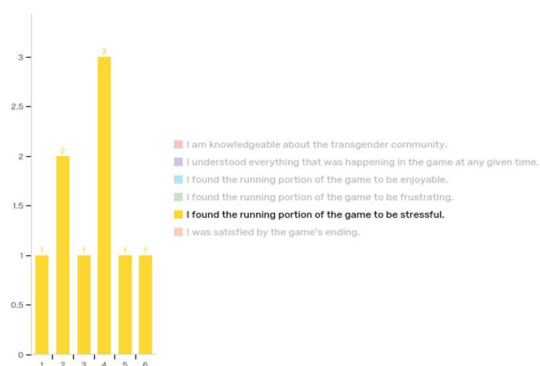


Figure 34: AlphaFest, question four, part five

Q4 - Please rate how strongly you agree with each statement.

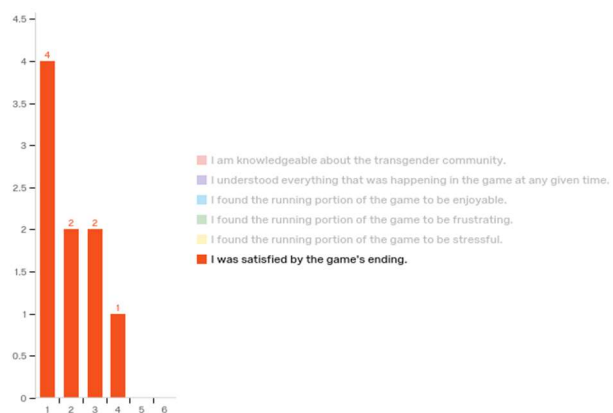


Figure 35: AlphaFest, question 4, part six

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	I am knowledgeable about the transgender community.	3.00	6.00	4.33	0.94	0.89	9
2	I understood everything that was happening in the game at any given time.	2.00	5.00	2.89	0.99	0.99	9
3	I found the running portion of the game to be enjoyable.	2.00	4.00	2.78	0.79	0.62	9
4	I found the running portion of the game to be frustrating.	2.00	6.00	4.22	1.03	1.06	9
5	I found the running portion of the game to be stressful.	1.00	6.00	3.44	1.50	2.25	9
6	I was satisfied by the game's ending.	1.00	4.00	2.00	1.05	1.11	9

Figure 36: AlphaFest question four results table

Figures 30 through 36 are visualizations of the values reported across all likert scale prompts for survey question number four. Looking at the average response value of 4.33, playtesters considered themselves moderately knowledge about the transgender community. Playtesters generally did not understand what was happening, no respondent rating this prompt at the maximum of six. Players found the running minigame to be more frustrating than enjoyable, with the response average 1.44 points higher. Players also found the running minigame to be more frustrating than stressful, with the response average 0.78 higher. The lowest scores awarded to any prompt was for game ending satisfaction. The average was a score of 2.00 while no playtester rated the ending's satisfaction higher than 4.00.

When asked how the running portion of the game made the player feel, seven of the nine submitted responses contained the word "confused." One respondent reported that they felt stressed. One respondent reported that they felt both "frantic and confused."

Q6 - Do you want to play the game again?

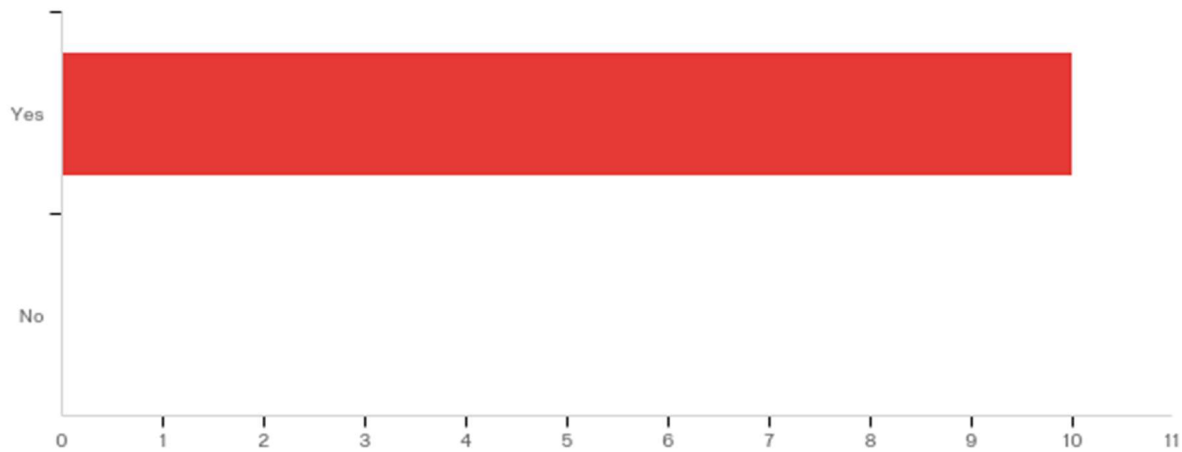


Figure 37: AlphaFest, question six

Figure 37 depicts the results for question six; “do you want to play the game again?”

Every single playtester said that they wanted to play the game again. Those who answered yes were prompted to answer the follow up question “why did you want to play the game again?”

Six testers indicated that they wanted to replay it because they wanted to better understand the mechanics. One respondent indicated it was because they felt they performed poorly in the minigame and wanted to “redeem” themselves. Two respondents reported that they wanted to play again because they thought that there might be more narrative to uncover.

Q8 - Do you think it's possible to win the game?

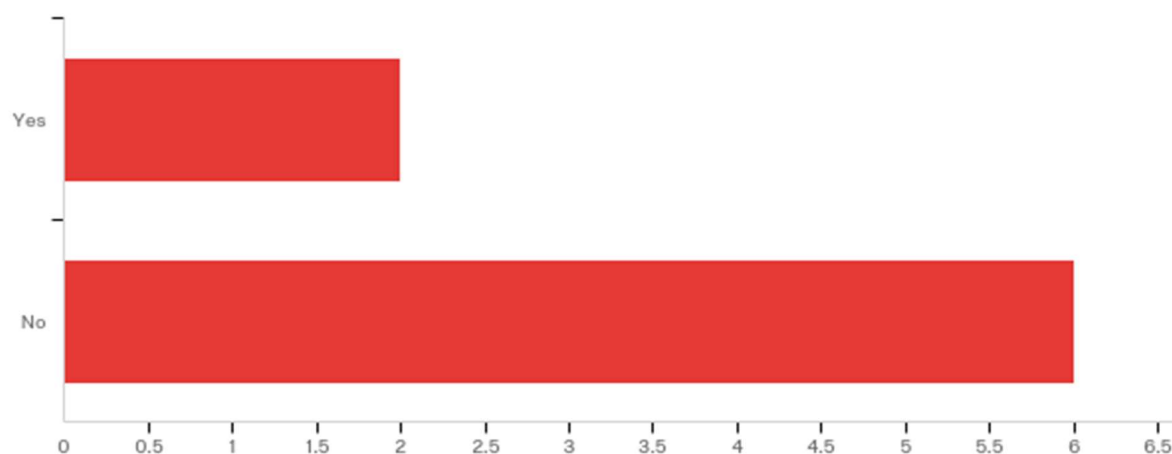


Figure 38: AlphaFest, question eight

Figure 38 visualizes the results from survey question eight; “do you think it’s possible to win the game?” 75% of testers did not believe that the game could be “won” while 25% did.

The survey’s final question allowed users to leave comments about their experiences. One user said, “I think this is probably clear, but I need more scaffolding when the running started.” Another user said, “The narrative started out really well, the view is broad but it guided me to walk on the stairs. But things disappear too fast.” A user also mentioned, “I want to go into the building but I can’t.”

Changes

This round of testing occurred during WPI’s “AlphaFest” event, where both the mechanics and narrative of the game were not yet finalized. In general, testers seemed to be confused about both the narrative and mechanics. The confusion surrounding the narrative spurred from its technical implementation. At that stage of development, different lines of dialogue were triggered by walking over a collision box that functioned as a trigger. If a player just ran forwards, then the narrative lines would just scroll by before they had a chance to read

them. This made it apparent that the dialogue text system had to be reworked in a way that accounted for the time that it took for a player to completely read the dialogue. The minigame had used the meter system, discussed in the “Game and Experience Design Process” chapter of this paper. Playtesters found that all of the unexplained information presented to them at once was overwhelming. There was also no consistent visual feedback that let the player know what sort of impact their actions had on the game. It was during this session that a playtester mentioned that a rhythm game might communicate the scenario better. I agreed and from that point forward reworked the minigame to incorporate rhythm game elements.

Round 1

This was my second testing opportunity. It occurred after the rhythm elements were added to the minigame section and the game was fully voice acted. It took place in late January of 2018. At this phase, I tested *Bound* with four people.

Data

During this round of testing, local analytics data was saved and recorded. According to this data, the average time players spent in the pre-minigame state was 99.58 seconds with a maximum of 136.7 seconds. The average time players spent in the running minigame portion of the game was 37.74 seconds. The least amount of time players spent in the minigame was 10.1 seconds while the most amount of time was 70.6 seconds. The average playthrough time across all testers was 137.36 seconds. One tester failed during time stage 1, one tester failed during time stage 2, two testers failed during time stage 5 and one tester failed during time stage 8.

When asked to briefly describe the game’s narrative, every playtester correctly identified that the narrative involved wearing a binder and attempting to run in it. 75% of those testers also reported that the game addressed transgender identities. Some responses were

hyper specific. For example on responded, “a transperson who now wears a binder used to really enjoy running. They went back to their middle school track to try to run again, despite health warnings telling them not to engage in physical exercise while wearing the binder. As they began to run, they could no longer catch their breath and they fainted. The (doctor?) or concerned person they woke up to didn’t understand why they had ignored the warnings.”



Figure 39: Round 1 word cloud generated from survey question three

Figure 39 represents a word cloud generated by users being prompted to describe their experience in three words. Unimportant articles such as “a” or “the” were culled. Most words were not repeated across testers. The only word written more than once was “free,” which was repeated by the same respondent. Their three words were “free,” “not free,” and “panicked.” Four words in this cloud are associated with negative emotions; “underwhelming,” “sad,”

“frustrated,” and “panicked.” While three words are associated with wistfulness or intrigue; “hopeful,” “free,” and “curious.”

Users were then asked if there was anything that they were confused by. One respondent said “Not really. I like the narrative concept, but I’m not sure using a rhythm game mechanic was the best choice for the intended effect of breathlessness with a binder (or at least not this implementation of it). Maybe there were more parts to the game.” The three other recorded testers indicated that they were confused by some aspect of the running minigame controls.

Q4 - Please rate how strongly you agree with each statement.

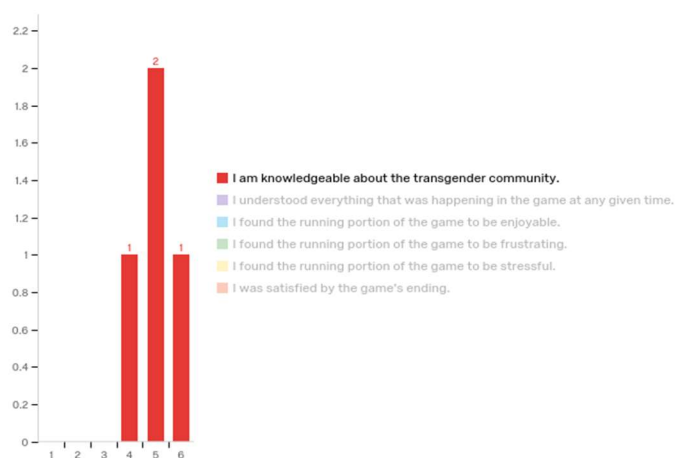


Figure 40: Round 1, question four, part one

Q4 - Please rate how strongly you agree with each statement.

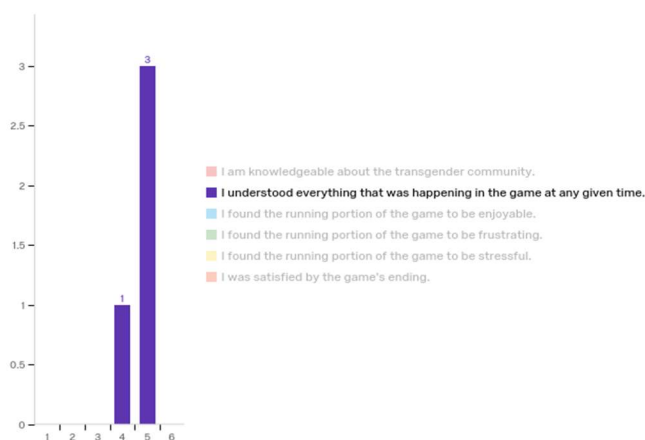


Figure 41: Round 1, question four, part two

Q4 - Please rate how strongly you agree with each statement.

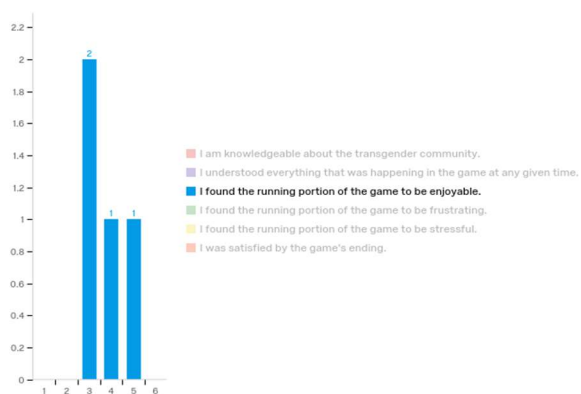


Figure 42: Round 1, question four, part three

Q4 - Please rate how strongly you agree with each statement.

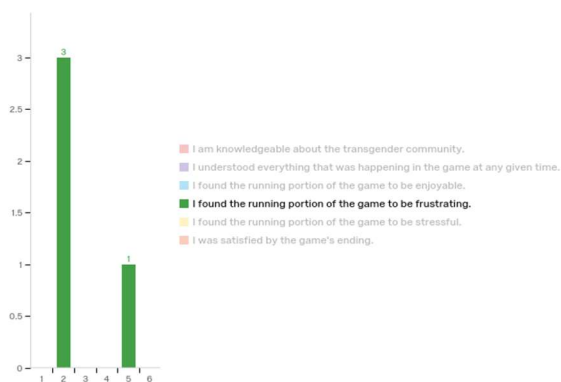


Figure 43: Round one, question four, part four

Q4 - Please rate how strongly you agree with each statement.

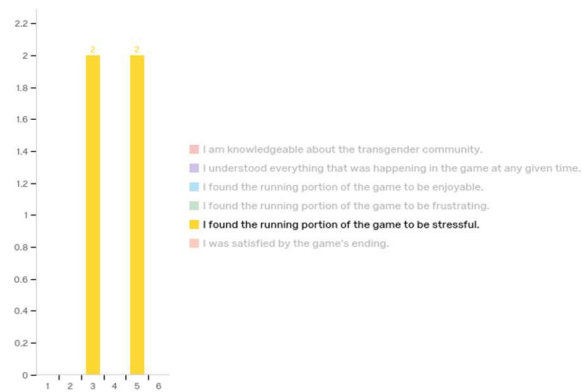


Figure 44: Round 1, question four, part five

Q4 - Please rate how strongly you agree with each statement.

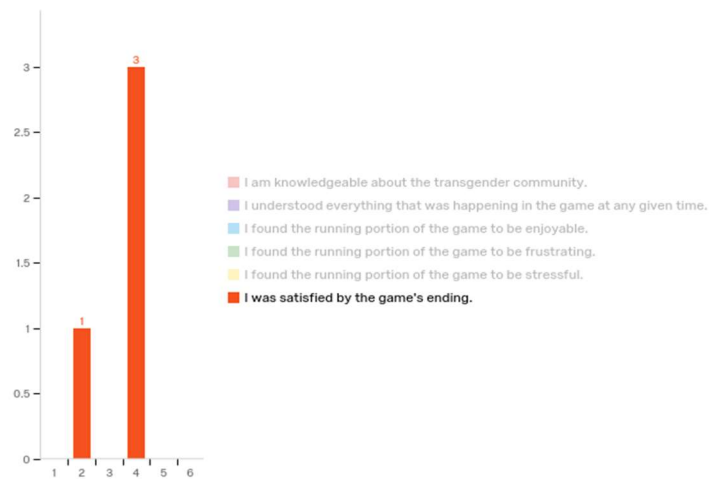


Figure 45: Round 1, question four, part six

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	I am knowledgeable about the transgender community.	4.00	6.00	5.00	0.71	0.50	4
2	I understood everything that was happening in the game at any given time.	4.00	5.00	4.75	0.43	0.19	4
3	I found the running portion of the game to be enjoyable.	3.00	5.00	3.75	0.83	0.69	4
4	I found the running portion of the game to be frustrating.	2.00	5.00	2.75	1.30	1.69	4
5	I found the running portion of the game to be stressful.	3.00	5.00	4.00	1.00	1.00	4
6	I was satisfied by the game's ending.	2.00	4.00	3.50	0.87	0.75	4

Figure 46: Round 1 question four results table

Figures 40 through 46 are visualizations of the values reported across all likert scale prompts for survey question number four. Looking at the average response value of 5.00, playtesters considered themselves very knowledgeable about the transgender community. Playtesters generally understood what was happening. All respondents for that prompt answered with either a score of four or five. Still, no playtesters responded with the maximum of six. Players found the running minigame to be slightly more stressful than enjoyable, with the response score average .25 higher. Players also found the running minigame to be more stressful than frustrating, with the response score average 1.25 higher. Playtesters, on average, rated the ending of the game's satisfaction level at 3.5, moderately satisfactory.

Players were then asked how the running portion of the game made them feel. Three of the four respondents had the key word "stress" in their answers. For example, a user stated, "It was stressful when the screen started fading to black, but not overwhelming." Additionally, two of the responses indicated that the narrowing field of vision was what contributed to their feeling of alarm or stress. However, one user remarked, "I felt more focused on trying to align the steps properly instead of on the subject matter. I might as well have been playing Guitar Hero."

Q6 - Do you want to play the game again?

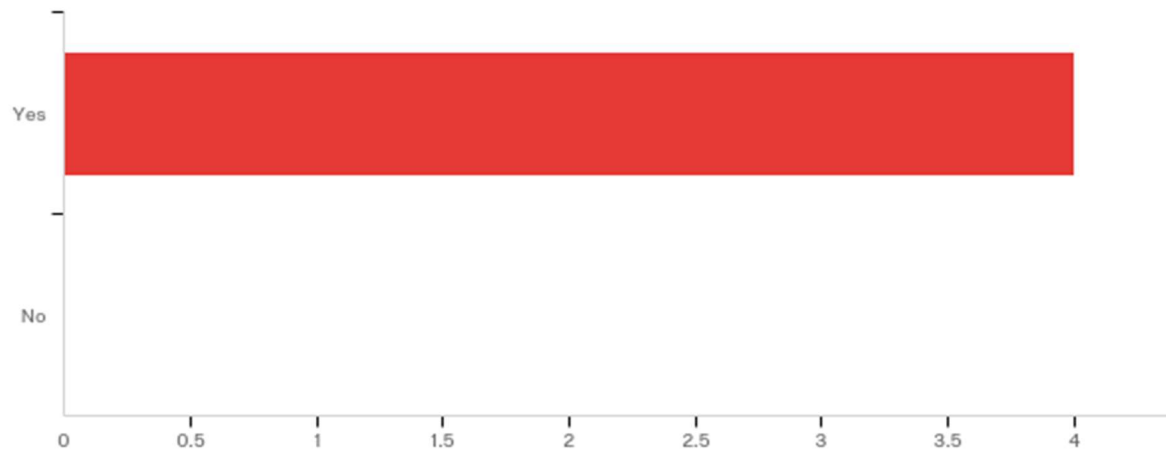


Figure 47: Round 1, question six

Similar to the AlphaFest playtesting, all testers wanted to play the game for a second time (Figure 47). When asked why they wanted to play the game again, three testers replied that it had to do with wanting to “get farther” in the minigame. One tester replied that they were interested to see the story develop further.

Q8 - Do you think it's possible to win the game?

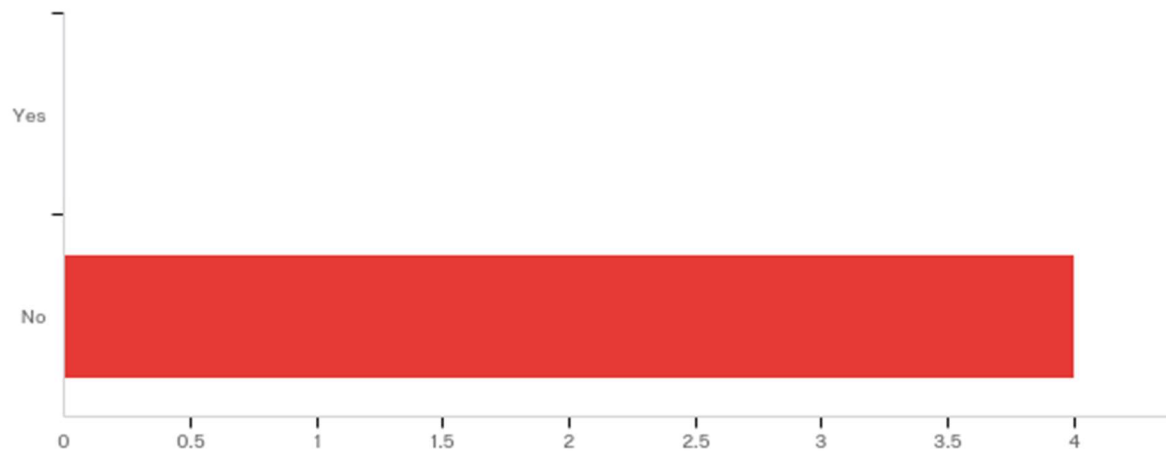


Figure 48: Round 1, question eight

Figure 48 is a visualization of survey question eight, “do you think it’s possible to win the game?” All tester did not think that it was possible to win the game.

When players were asked to report bugs, one respondent answered with “I didn’t encounter any real bugs, but I think the camera transition from the stairs to the track could be more fluid.” None of the other testers found bugs to report.

The final question asked testers to leave any general comments or concerns about their experience. One tester replied, “Again, I like the concept, but the running seems too much like a minigame at the moment. I think it would be more engaging if there was some way for players to be more connected to the feeling of constriction or breathlessness from the binder.” Another tester answered,

I really felt connected to the narrative and connected to the character!” One tester had no comments, while the final tester replied, “I’m not sure if the game would be helped or hindered by any brief explanation of the controls in the beginning, because I think they’re actually quite intuitive, but my first instinct **was** to press W immediately and start running, which “hurt” the character/slowed the character down, so that was a bit alarming. However, this alarm might be intended, as it did contribute to the overall effect of a sort of panicked desperation. This was aided by the sound and visual effects.

Changes

Many of the initial problems in clarity of narrative and mechanics identified at AlphaFest had been solved by this point. Moving forward, the changes made were minute. The one element of the game that was noted to be awkward by multiple testers was the animation from the top of the stairs to the track. While it did communicate to players that control of the player character was being revoked from them, it was strange, rigid, and didn’t incorporate any of the sound effects typically associated with character movement. It performed this way because the animation was done in code rather than in Unity’s animation system. One of the playtesters

suggested that it may work to replace the animation with another fade out to black and then black in when the character is running. I agreed and implemented the fading. Because a short amount of time had passed, it seemed awkward to have just the fade with nothing accompanying it. So, I saved the last line of preminigame dialogue to play when the black screen is present.

Round 2

This was my third testing opportunity. It took place in early February of 2018. At this phase, I tested *Bound* with five people.

Data

During this round of testing, gameplay data was recorded to a local file. According to this data, the average time players spent in the pre-minigame state was 127.4 seconds with a maximum of 281.4 seconds. The average time players spent in the running minigame was 17.6 seconds. The least amount of time players spent in the minigame was 4.1 seconds while the most amount of time was 43.5 seconds. The average playthrough time across all testers was 150.0 seconds. One tester failed in time stage 0, three testers failed in time stage 1 and one tester failed in time stage 5.

When players were asked to briefly describe the narrative in their own words, only two responses contained the word “transgender” or “trans.” One tester identified that the game was about running, but didn’t understand the binder discussed in the game was a chest binder. They wrote, “The game was about a person going back to middle school and running like he used to again in some sort of binders and running shoes, that perhaps making him run faster but at the same time have some side effects.”

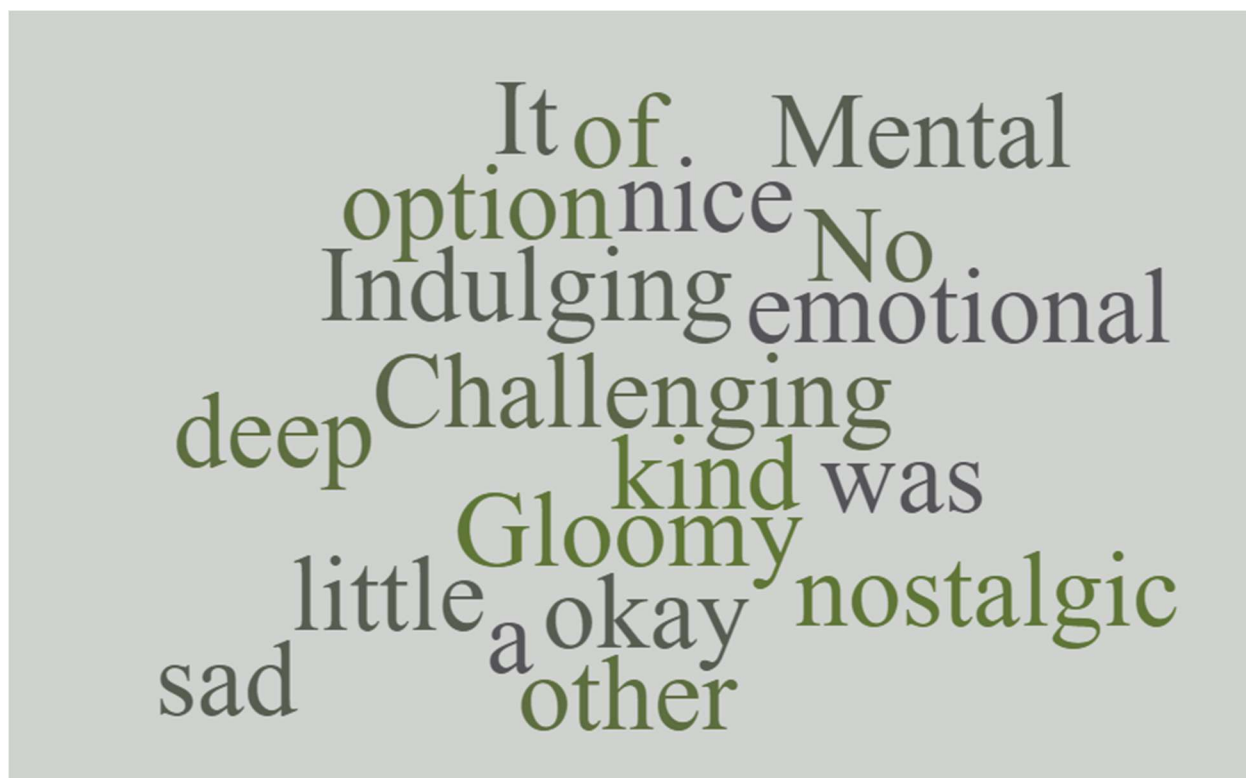


Figure 49: Round 2 word cloud generated by survey question three

Figure 49 is a word cloud that was generated from testers being asked to describe their experience in three words. Not a single word was repeated more than one time. Five words linked to emotion were used to describe the game; “nostalgic,” “Gloomy,” “deep,” “emotional,” and “sad.” Two of these five words, “Gloomy,” and “sad” are associated with negative emotions. Three words were used to describe the quality or difficulty of the content; “challenging,” “nice,” and “okay.”

In the third survey question, players were asked to identify anything that was confusing to them. One player remarked, “I didn’t really see how it related to the trans community.” Another respondent answered, “Yes. As soon as the first narrative ended (before we ran on the track) it wasn’t clear that we had to run and get to the track. Perhaps an indicator that says

press w to run?" A third reported, "I wasn't sure what I was supposed to in the beginning." Two participants were not confused by anything.

Q4 - Please rate how strongly you agree with each statement.

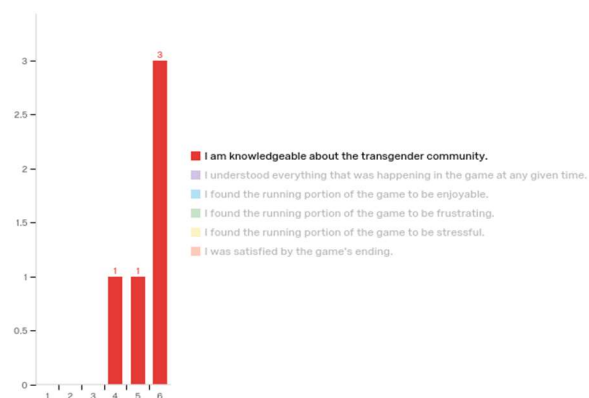


Figure 50: Round 2, question four, part one

Q4 - Please rate how strongly you agree with each statement.

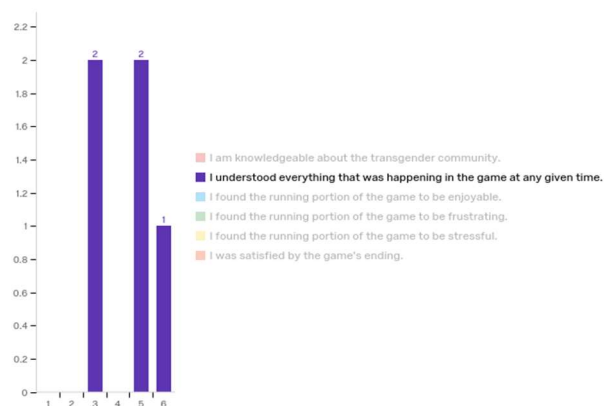


Figure 51: Round 2, question four, part two

Q4 - Please rate how strongly you agree with each statement.

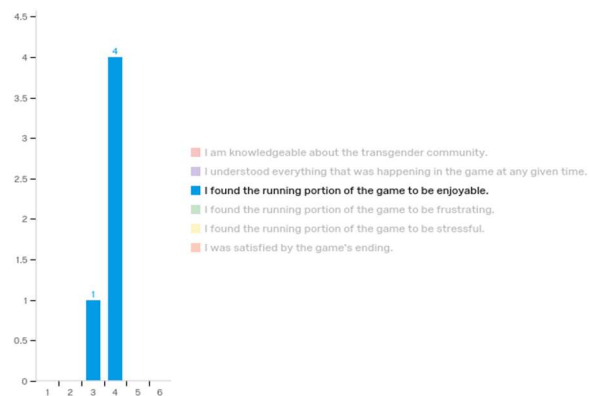


Figure 52: Round 2, question four, part three

Q4 - Please rate how strongly you agree with each statement.

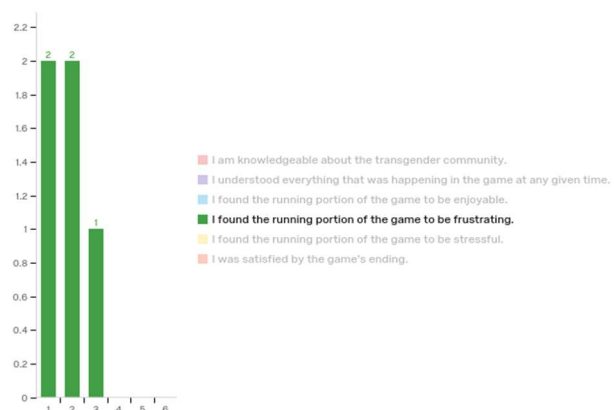


Figure 53: Round 2, question four, part four

Q4 - Please rate how strongly you agree with each statement.

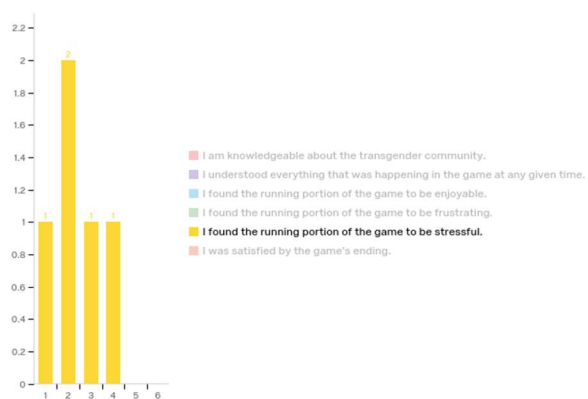


Figure 54: Round 2, question four, part five

Q4 - Please rate how strongly you agree with each statement.



Figure 55: Round 2, question four, part six

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	I am knowledgeable about the transgender community.	4.00	6.00	5.40	0.80	0.64	5
2	I understood everything that was happening in the game at any given time.	3.00	6.00	4.40	1.20	1.44	5
3	I found the running portion of the game to be enjoyable.	3.00	4.00	3.80	0.40	0.16	5
4	I found the running portion of the game to be frustrating.	1.00	3.00	1.80	0.75	0.56	5
5	I found the running portion of the game to be stressful.	1.00	4.00	2.40	1.02	1.04	5
6	I was satisfied by the game's ending.	2.00	5.00	3.20	1.17	1.36	5

Figure 56: Round 2 question four results table

Figures 50 through 56 are visualizations of the values reported across all likert scale prompts for survey question number four. Looking at the average response value of 5.40, playtesters considered themselves extremely knowledgeable about the transgender community. Playtesters generally understood what was happening, the average for that prompt being 4.40. One tester even responded with a six. Players found the running minigame to be more enjoyable than stressful, with the response score average 1.40 higher. Players also found the running minigame to be more enjoyable than frustrating, with the response score average 2.00 higher. Playtesters did, however, find the game to be more stressful than frustrating, with the response score average 0.60 higher. Playtesters, on average, rated the ending of the game's satisfaction level at 3.20, moderately satisfactory.

Next, testers were asked how the game made them feel. One respondent reported, "In the running section I pressed the buttons fairly quickly and the character quickly fell unconscious. It felt unfair." Another tester said, "A bit constricting tbh. Like the MC was

suffocating.” Another tester remarked, “It made me feel nice the person was running again as was their wish, but sad they could not run like wanted to and passed out.”

Q6 - Do you want to play the game again?

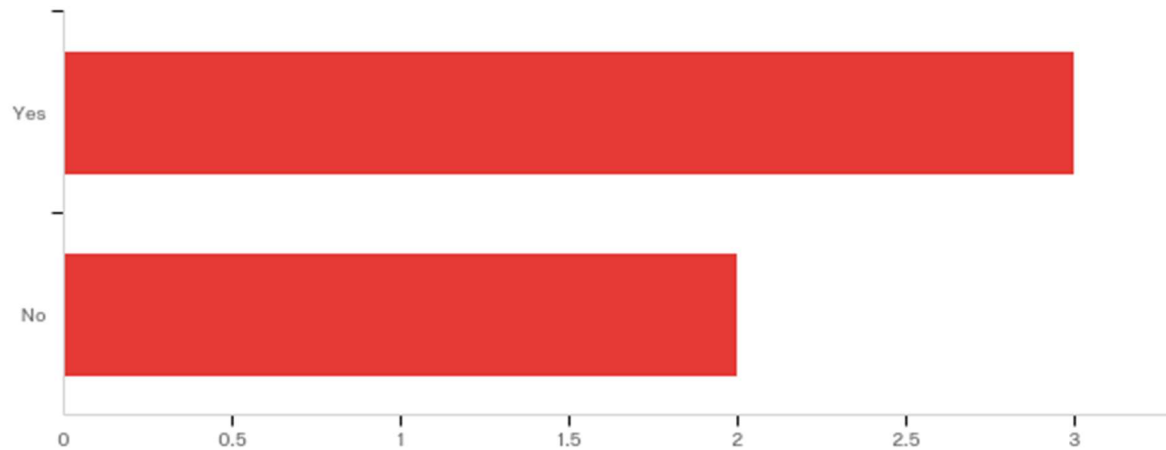


Figure 57: Round 2, question six

Figure 57 visualizes the responses to question number six. When asked if they wanted to play the game again, three testers said yes while two said no. When asked why they wanted to play again, two respondents identified it was because they missed something key to their understanding of the game’s message in their first playthrough. One tester identified an emotional reason.

Q8 - Do you think it's possible to win the game?

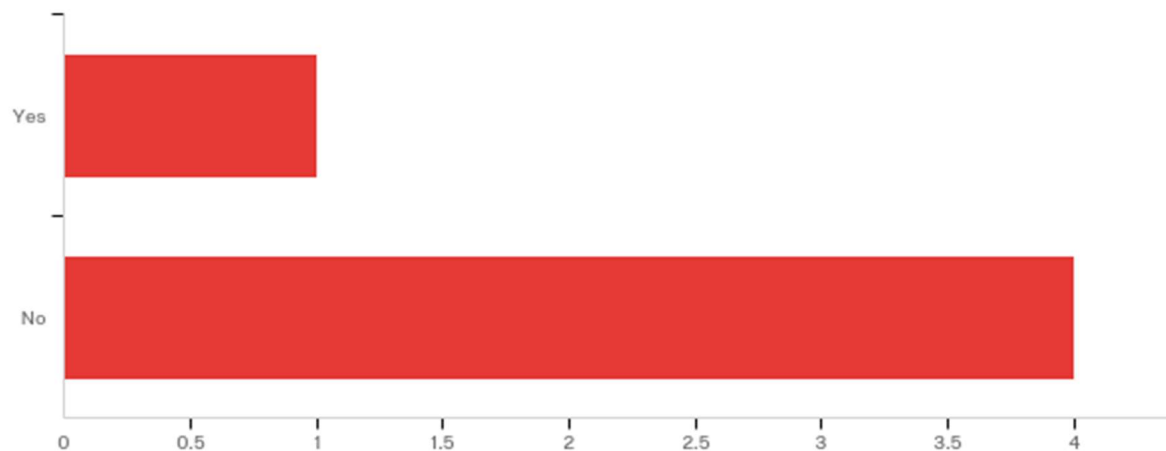


Figure 58: Round 2, question eight

Figure 58 illustrates the responses to survey question number seven, “do you think it’s possible to win the game?” Only twenty percent of respondents believed that it was possible to win.

No testers reported coming across any bugs. Testers were then asked to leave general comments or concerns about their experience. One tester replied, “For the non gamers like myself, maybe if there was a way to tell people, its time to go at the start of the game or move during the game, it might be nice. Basically a guide.” Another tester replied, “Still early on, keep up development, still needs more formalized theme and goal, but I can tell you haven’t got there yet.”

Changes

This was by far the most peculiar round of playtesting that I experienced. If 80% of my testers were immediately failing the minigame, then some information about the mechanics of the minigame had to be the culprit. The only thing that had been changed from testing round 2 to testing round 3 was the animation that preluded the minigame. I discovered that it took two full seconds from the end of that animation for the game to spawn the first prompt. In this brief window, the only thing that’s displayed on the screen is the receivers and the keys that they correspond to. During this time, players started pressing all of the keys that were displayed on the screen, even though they were only labeling the receivers. By the time the prompts started to spawn and the playtesters had realized their mistake, it was too late. To remedy this issue, I altered the game manager so that the prompts would start at the second that the transition animation occurred. The idea was that if the first thing that catches the attention of the player is the moving prompts, then they will both be less likely to press the receiver label keys and recognize the rhythm game conventions being utilized.

Summative Evaluation

Round 3 was my final testing opportunity. Instead of using player feedback to work on the content of the game, I used it to evaluate whether or not the game was meeting its experience goal. This session took place in late February of 2018. For this phase, I tested *Bound* with eight people.

Round 3

During this round of testing, gameplay data was recorded to a local file. According to this data, the average time players spent in the pre-minigame state was 98.0 seconds with a maximum of 141.0 seconds. The average time players spent in the running minigame was 53.2 seconds. The least amount of time players spent in the minigame was 31.6 seconds while the most amount of time was 67.7 seconds. The average playthrough time across all testers was 151.2 seconds. One tester failed in time stage 3, one tester failed in time stage 4, two testers failed in time stage 6, three testers failed in time stage 7, one tester failed in time stage 8.

In the next survey question testers were asked to briefly describe the game in their own words. During this session, every single tester identified that the game revolved either around the physical limitations of wearing a chest binder or about transgender identities. One tester even mentioned the gameplay is situated as a memory, “The player is a trans person who used to like running, and hasn’t been able to run because they wear a binder. The narrative takes place with them in a doctor’s office, I think? And it’s from after they’ve passed out.”



Figure 59: Round 3 word cloud generated by survey question three

Figure 59 is a word cloud generated from testers being asked to provide three words that best describe their experience. The word “stressful” was repeated across two respondents. “Understandable” and “understanding” were submitted by two separate testers, it’s important to note their similarity. All other words were only submitted once. Ten words are linked to emotion; “emotional,” “stressful,” “lonely,” “nerve-wracking,” “hectic,” “Helpless,” “saddening,” “bittersweet,” “empty,” “anxiety-inducing,” and “frustrated.” Of these words, half are related to stress or the strain of a high intensity environment.

The next question in the survey asked players to identify anything in the game that was confusing to them. Half of the testers were not confused by anything. One tester said, “...is there a way to win? Is that the point?” Another tester reported, “I know what a binder is, but I could potentially see how someone could be confused by what this is and what it is used for. I

was actually wanting to explore the world more – like see what was around the building, and the staircase just looked so intriguing.” Another tester commented, “It wasn’t immediately clear to me how missing the footstep corresponded to me passing out. I feel like some other visual cue for oxygen loss might help, though you do have the audio and the game fading to black, so hm. That’s just my two cents tho.”

Q4 - Please rate how strongly you agree with each statement.

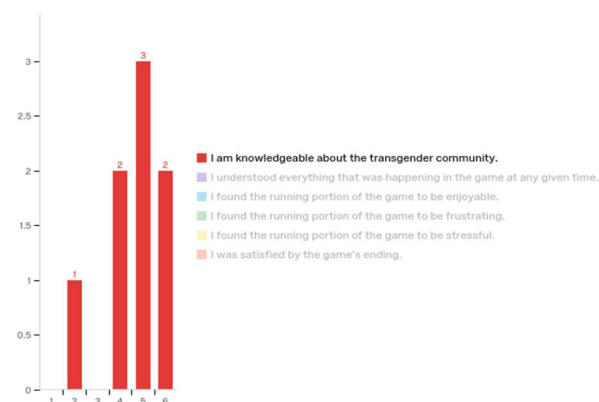


Figure 60: Round 3, question four, part one

Q4 - Please rate how strongly you agree with each statement.

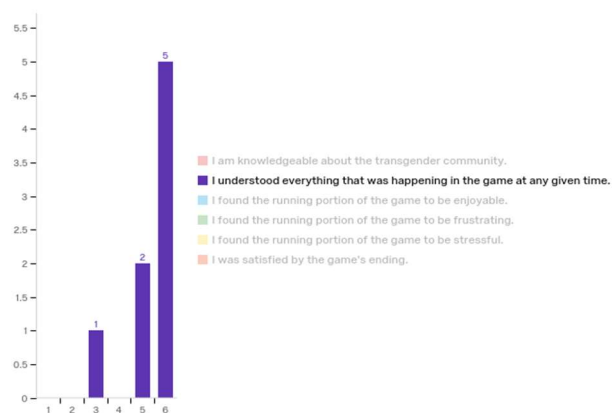


Figure 61: Round 3, question four, part two

Q4 - Please rate how strongly you agree with each statement.

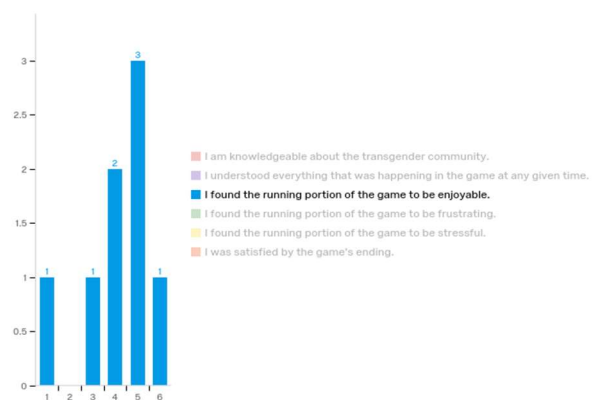


Figure 62: Round 3, question four, part three

Q4 - Please rate how strongly you agree with each statement.

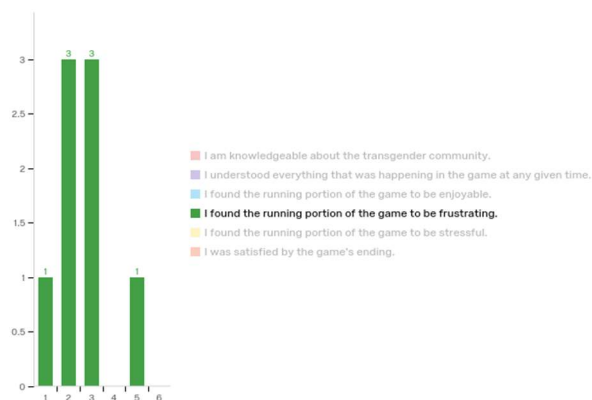


Figure 63: Round 3, question four, part four

Q4 - Please rate how strongly you agree with each statement.

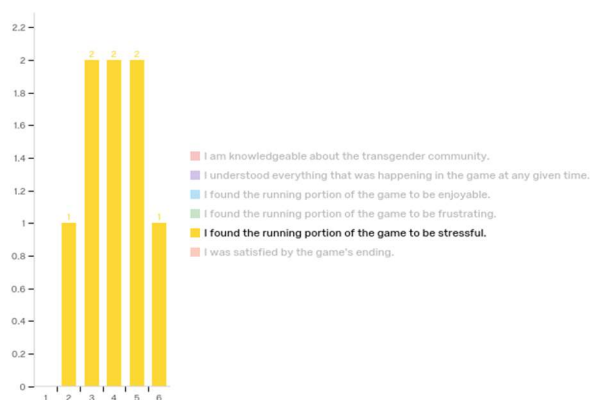


Figure 64: Round 3, question four, part five

Q4 - Please rate how strongly you agree with each statement.

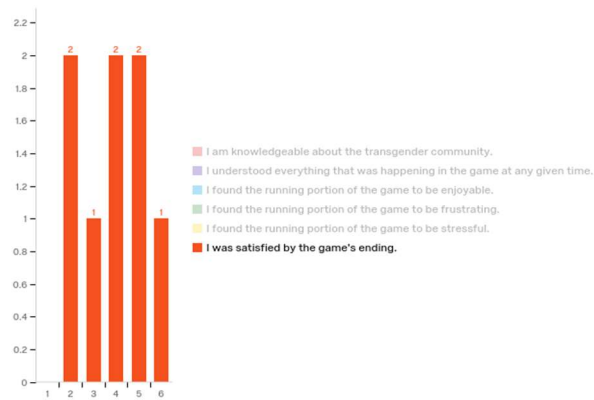


Figure 65: Round 3, question four, part six

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	I am knowledgeable about the transgender community.	2.00	6.00	4.63	1.22	1.48	8
2	I understood everything that was happening in the game at any given time.	3.00	6.00	5.38	0.99	0.98	8
3	I found the running portion of the game to be enjoyable.	1.00	6.00	4.13	1.45	2.11	8
4	I found the running portion of the game to be frustrating.	1.00	5.00	2.63	1.11	1.23	8
5	I found the running portion of the game to be stressful.	2.00	6.00	4.00	1.22	1.50	8
6	I was satisfied by the game's ending.	2.00	6.00	3.88	1.36	1.86	8

Figure 66: Round 3 question four results table

Figures 60 through 66 are visualizations of the values reported across all likert scale prompts for survey question number four. Looking at the average response value of 4.63, playtesters considered themselves moderately knowledge about the transgender community. Playtesters really understood what was happening, the average for that prompt being 5.38. Players found the running minigame to be slightly more enjoyable than stressful, with the response score average 0.13 higher. Players also found the running minigame to be more enjoyable than frustrating, with the response score average 1.50 higher. Playtesters did,

however, find the game to be more stressful than frustrating, with the response score average 1.37 higher. Playtesters, on average, rated the ending of the game's satisfaction level at 3.80, moderately satisfactory.

Testers were then asked how the game made them feel. One tester responded, it was completely anxiety-inducing. Kind of reminded me of guitar hero. At first I was confused why it's foot steps if the game really is about my breath, but then I thought, "I guess it must be much more about moving your feet and just having that take up all your mental capacity until you pass out. Right now, I'm kind of holding back tears just because I felt like the game was stressful and I wanted to look at the environment more.

I generally do not enjoy running either.

Another tester reported, "It made me feel like it was inevitable that I was going to slip up. I figured it was just a matter of time." All testers expressed that the game made them feel a negative emotion such as terror, stress or frustration or that their fate had been decided for them.

Q6 - Do you want to play the game again?

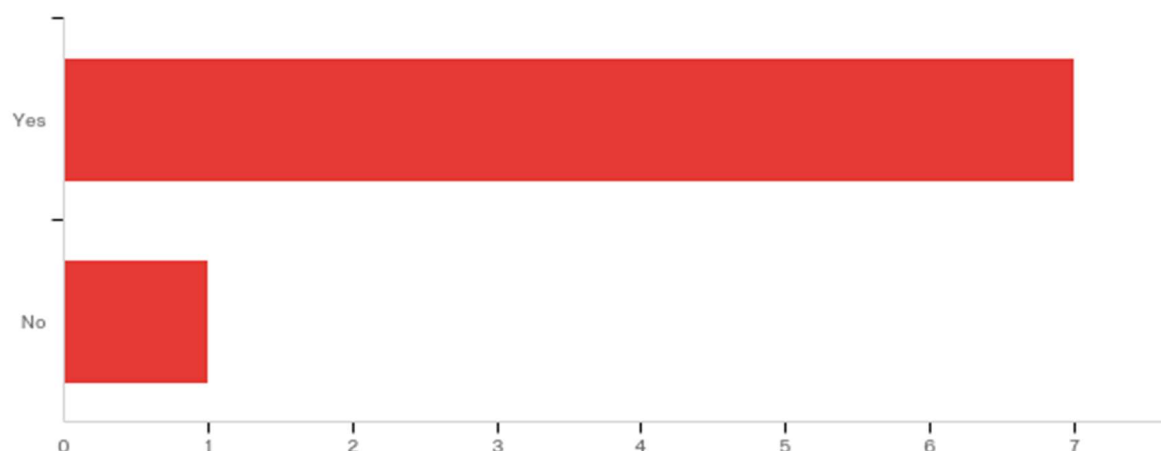


Figure 67: Round 3, question six

Figure 67 visualizes the responses to question six, “do you want to play the game again?” All but one playtester indicated that they did want to play again. Three testers explained that it was because they wanted to explore more scenery or uncover more narrative. Three different testers said that they wanted to see if they could perform better and last longer on their next playthrough.

Q8 - Do you think it's possible to win the game?

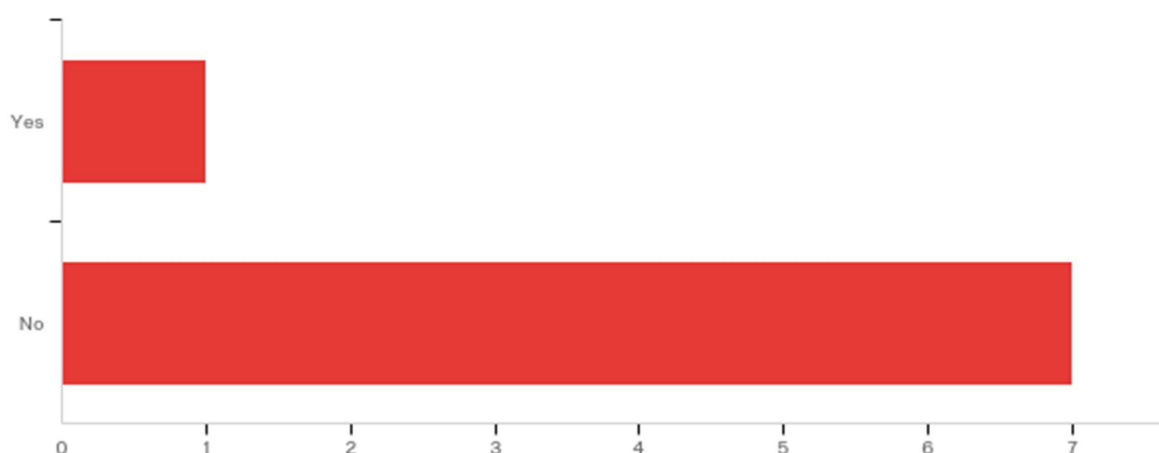


Figure 68: Round 3, question eight

Figure 68 visualizes the responses to question eight, “do you think it’s possible to win the game?” Only one tester thought that it was possible to win.

On the last question of the survey, players were asked to leave any general comments or concerns about their experience. One tester said, “I generally do not like running, so I’m not sure if that just increased my anxiety. I enjoy what the game is trying to convey. At some point I wish I could have seen a binder – maybe when talking to the doctor at the end, like if he gives you back the binder after making sure you are okay.” Another tester responded, “Overall, I thought it was nice! The narrative wasn’t heavy handed which is hard to accomplish in serious games, so good job.”

Discussion

In the “Final Experience and Game Design” chapter of this paper, I defined *Bound*’s experience goals as, “to elicit the physical and mental stress that is associated with running in a chest binder. *Bound* is not an experience that is supposed to be fun or enjoyable, rather it is supposed to be impactful and inspire introspection.” In retrospect, this was an impossible goal not only to accomplish but also to adequately measure. Each transmasculine person who binds, has a unique relationship with their binder and with fitness. The amount of physical and mental stress caused in this situation is entirely dependent on the individual. Because the game is autobiographical, it only reflects my personal experience. In trying to represent the hardships of an entire community, I may have perpetuated falsehoods about them. Furthermore, it’s incredibly difficult to gauge the degree to which players are anxious or stressed because of *Bound* – emotions and feelings are subjective. Even if there was an accurate way to measure anxiety and stress, what good does it do if the point of comparison, defined in the experience goal, fluctuates based on the subject?

The word cloud that was generated by the base of playtesters in the Round 3 subsection of the “Testing” chapter proves that *Bound*, at the very least, created an experience that was intense and emotional. In addition to this, every single tester in Round 3 was able to identify that the game was about the limitations of wearing a chest binder or about transgender people. This proves that they were forced to consider a new perspective which inspires cognitive empathy. The impact expressed by some testers in the survey results for Round 3, speak to *Bound*’s success as an empathy game.

Thinking back to my intentions at the beginning of this project, I realize that I did not make *Bound* for the community that I belong to. I think frequently about the words of Merritt K

in the “Background” chapter of this paper. Their insight and this project leave me with questions that I can only pose to other designers of queer and transnarrative experiences rather than answer myself. Is *Bound* a mistake, considering transgender people are underserved in terms of mainstream media representation? Do games like *Bound* appropriate the experiences of transgender people, a nonprivileged body, for the benefit of privileged people? Are we fetishizing the lives of the transgender community for others to ogle over? Can games affect change? How much harm does perpetuating a stereotype do? I encourage my fellow queer creatives to continue to do and to make, regardless of the fear of failure. The world needs more diverse voices to be heard, represented and cherished.

Personal Journey

During my sophomore year of college, I took a game industry specific “Social Issues” course. A large portion of the syllabus included developing a game that was inspired by something politically relevant. I had just recently come out as a transgender man and I was full of anger. Angry at my biology, angry at the Trump administration (that hasn’t changed), and angry at my helplessness. My existence was, and still is, political. My rights are a passing topic of debate at the dinner table in the homes of white, middle class families. At the time that I write this paper, transgender service members are banned from serving in the armed forces. I wanted to make a game that was personal and could act as a funnel for all of the injustice that I was feeling. The “bathroom bill”, a piece of legislation which forced transgender people to use the public restroom that corresponded with the sex listed on their birth certificate, had just been established in North Carolina. I wanted to make a game about it.

This was my first foray into the world of designing social impact games. I felt that the work that I was doing was both important and impactful. It was my way of practicing “introverted activism.” I’m not a person who feels comfortable engaging in traditional grassroots political efforts. I would never go knocking on people’s doors or cold call phone numbers to have conversations about transgender rights. In channeling that energy into my work or into a piece of writing, I have time to properly articulate my argument and then immediately, emotionally distance myself from its reception. It’s exhausting to have to continuously defend something that is core to your identity.

When I think about *Gotta Go*, the aforementioned game, I think about how I genuinely felt that I was affecting change through its content. It features a cast of transgender characters,

both binary and nonbinary, making their way across the city of Raleigh, North Carolina to a technology convention. Players manage the bladder and anxiety levels of these characters as they are forced to use restrooms with this bill in place. The characters endure negative events that are taken from real stories about transgender people in restrooms. Despite its flaws, which stemmed from my general design inexperience, I felt that forcing a cisgender player base to confront the same discrimination as transpeople – even in a description – was making a measurable emotional impact. This belief ultimately inspired me to make even more games about the community that I belong to.

The creation of *Bound* has been a process of discovery. I started the project with the same drive and passion that had propelled me through the development of *Gotta Go*. This time, I was going to tackle “sharing” a more personal trans experience. I had just recently had gender affirming top surgery and had donated my old chest binder to a friend. While, I was happy to be able to help someone else feel more comfortable in their gender expression, it was a bitter sweet moment. That binder, as much physical pain as it had sometimes brought me, was my source of confidence. It felt like it had become a part of my body. Getting rid of my old binder marked my passage into a new lifestyle. Suddenly, I found myself being motivated to go on morning runs and spend time at the gym. I realized that my binder was the item that was preventing me from doing these things that I enjoyed. *Bound* stemmed from a manifestation of that realization.

Bound has proven itself to be more an expression of my personal turmoil than a tool that allies can use to appropriate the plight of their transgender friends. This isn’t what I set out to do on my “noble” quest to make queer experiences more accessible for non-queer people.

However, I've come to the conclusion that it's impossible to recreate an experience so intimate, important and painful. This is, in my opinion, true for all empathy games – not just games revolving around transgender experiences. Empathy is a skill that is exercised and exploited by games, not necessarily something that can be learned through them. There's a transformative article, written by Teddy Pozo, that explores the question of empathy in games. My opinion, previously stated, align with their central argument [25].

I could, say, recreate the physical experience of wearing a chest binder for a cisgender woman. While that individual would immediately recognize the physical discomfort, they would not feel the gender euphoria induced by achieving a flat chest. In general, noticeable breasts are not a source of gender dysphoria for cisgender women. Even if I did have the ability to make a player of my game genuinely experience the emotions that I associate with being gendered correctly or having a flat chest, they are not universal to the entire transgender community. I can only share my individual lived experiences, to an extent, through my work. Although, I'm transgender, I come from a place of privilege. I'm white and male identifying and cis-passing. There is no conceivable way for me to even imagine how I would portray the hardships of transgender women of color, for example. *Bound* has taught me that this is okay. My games don't *have* to champion the validity of an entire community. My games can be much like diary entries and people will disagree with how they're designed and glean different things from them. I cannot magically give someone the knowledge of what it's truly like to be transgender through my games. All I can do is ask them to consider what it might be like. If I can achieve that, then I'm proud of what I've accomplished.

Future Work

Bound captures a vertical slice of my past and illuminates a narrative that is absent from popular culture and media. I'm proud of what the game has become and all of the hours that I've sunk into it, hunched over behind a computer screen. As such, I do not plan to make any further changes to the game, despite the fact that an artist's work is never finished. It is absolutely rough around the edges but I'm ecstatic to walk away from the project having learned a great deal about myself, about empathy games and about my strengths as a designer.

I think that it's important that this game be published to an accessible platform. That's why I plan to release the game on Itch.io, a well-known online distributor popular among indie games, for free. While I don't think that the minigame portion in its current state completely captures the experience that I set out to recreate, it's an important artifact in my body work that also speaks to a very specific transgender experience. Playing "*Bound*" will not magically give players the genuine experience of running in a binder. However, it may force them to consider the physical limitations of transgender individuals that they hadn't before. Which is why I want the game to be as accessible as possible and am not asking for any money in return. I will give players the option to donate if they are financially able. Allow to also stress that playing this game does not substitute the required work of active ally-ship.

Appendix

Playtesting Consent Form

TITLE OF STUDY

Analyzing the Effectiveness of “Bound” Through Playtesting Feedback

PRINCIPAL INVESTIGATOR

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STUDENT INVESTIGATOR

Leo Bunyea
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PURPOSE OF STUDY

You are being asked to take part in a research study. Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. Please read the following information carefully. Please ask the researcher if there is anything that is not clear or if you need more information.

The purpose of this study is to evaluate the effectiveness of the mechanics and experience delivery techniques of “Bound.” The game is attempting to recreate an experience of a nonprivileged body, so it is especially imperative that measures are taken to ensure the content is accurately communicated. A nonprivileged body refers a person who have been denied certain rights, conveniences and privileges in society by their race, gender identity, sexual orientation, religious affiliation, etc. The nonprivileged body focused on in this study is the transgender individual which is especially vulnerable to verbal and physical discrimination. The results of this study will be used to informed future design decisions and improve the final game.

STUDY PROCEDURES

First you will be asked to play “Bound” to completion on the provided machine. The gaming experience consists of being seated in front of a monitor with a keyboard. The game will prompt you with a series of keys to hit quickly in succession to emulate the physical and mental stress of running. During your play session, metrics will be recorded and saved to a database. These metrics capture information about your play behavior within the game world. The experience should be between two and five minutes long. At the end of your play session, you will be given a participant ID used to link your gameplay metric data and survey responses. Next, you will be asked to fill out a short online survey about your play session. You may decline to answer any or all questions and you may terminate your involvement at any time if you choose. This should take a maximum of ten minutes.

The total duration of the study is between ten and fifteen minutes.

RISKS

The nature of the game’s mechanics and subject matter may cause you to experience stress. If you want to discontinue playing the game or participating in this study at any time, you can walk away and terminate your involvement in the study.

BENEFITS

In participating in this study, you are afforded the opportunity to learn about the plight of the transgender community. In addition to this, the results of this study will go towards creating an artifact of the transgender community, making their narrative more accessible to those that are unfamiliar.

CONFIDENTIALITY

Your responses to the survey and gameplay metrics will be anonymous. They will be linked together with the participant ID given at the end of the play session. Please do not write any other identifying information on your survey. Participant data will be kept confidential.

CONTACT INFORMATION

If you have questions at any time about this study, or you experience adverse effects as the result of participating in this study, you may contact the researcher whose contact information is provided on the first page. If you have questions regarding your rights as a research participant, or if problems arise which you do not feel you can discuss with the Primary or Student Investigator, please contact the IRB Chair (Professor Kent Rissmiller, Tel. 508- 831-5019, Email: kjr@wpi.edu) or the Human Protection Administrator (Gabriel Johnson, Tel. 508-831-4989, Email: gjohnson@wpi.edu).

VOLUNTARY PARTICIPATION

Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you decide to take part in this study, you will be asked to sign a consent form. After you sign the consent form, you are still free to withdraw at any time and without giving a reason. Withdrawing from this study will not affect the relationship you have, if any, with the researcher. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

CONSENT

I have read the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without any penalty. I voluntarily agree to take part in this study.

Participant's signature _____ Date _____

Investigator's signature _____ Date _____

Post-playtesting Survey Questions

- 1) How knowledgeable do you feel about the transgender community?
 - a) Likert scale (1-6)
- 2) Please, in your own words, briefly describe the game's narrative.

- a) Short answer
- 3) Please write three words that best describe your experience in the game.
 - a) Short answer
- 4) Rate your average understanding of what was happening in the game at any given time.
 - a) Likert scale (1-6)
- 5) Was there anything that you were particularly confused by?
 - a) Short answer
- 6) How did the running portion of the game make you feel?
 - a) Short answer
- 7) Please rate how enjoyable you found the running portion of the game to be.
 - a) Likert scale (1-6)
- 8) Please rate how frustrating you found the running portion of the game to be.
 - a) Likert scale (1-6)
- 9) Please rate how stressful you found the running portion of the game to be.
 - a) Likert scale (1-6)
- 10) Rate your satisfaction with the game's ending.
 - a) Likert scale (1-6)
- 11) Do you want to play the game again?
 - a) Yes
 - b) No
- 12) If so, why do you want to play the game again?
 - a) Short answer
- 13) Do you think that it's possible to win the game?
 - a) Yes
 - b) No
- 14) Please record any bugs that you noticed while playing.
 - a) Short answer
- 15) Any general comments or concerns about your experience?
 - a) Short answer

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